

Aviation News

McGraw-Hill Publishing Company, Inc.

JUNE 12, 1944



Paratroopers Prove Themselves: D-Day operations were spearheaded by the greatest air-borne attack ever carried out, and early reports showed that the paratroopers and glider forces, shown here in a maneuver in Britain, were successful beyond expectations in establishing firm pools of vertical invasion, seizing key bridges, rail junctions and smashing enemy strongpoints, virtually isolating the beaches and enabling landing forces to establish beachheads where the Germans could not bring up local reinforcements.

Arnold Sees Cut in '45 Plane Needs

Tells House group AAF's requirements are "decidedly lower in number and considerably lower in total weight".....Page 9

Airlines Study Plane Returns

Representatives of seven companies seek formula for determining prices at special meeting in ChicagoPage 39

Invasion Supreme Test for AAF

Vast numbers of planes open big offensive, paralyzing Nazi communications and furnishing extra fine power.....Page 7

Invasion Effect on Schedules

Top officials in Washington see no immediate change in output or employment beyond revisions already planned.....Page 13

Airline Officials' Stock Purchases

Buying of equities in own firms is 7½ times sales during April; 17,708 bought and 2,343 sold, SEC report shows.....Page 52

Navy's Warplane Range Extended

Emergency conversion of bombers into transports gives preview of what's likely in post-war developments.....Page 21

Termination Article Adopted

Board acts to speed subcontractor settlements; summary of week's activities on industrial mobilization front.....Page 11

Piper Developments Appraised

Company's role in supplying Civil Pilot Training program puts it in position to dominate post-war lightplane field.....Page 16

Curtiss
COMMANDO
 uses
VICKERS
HYDROMOTIVE
CONTROLS

VICKERS Hydraulic Equipment is used on many of the most modern airplanes. The Curtiss "Commando" Cargo-Transport illustrated here is representative.

Vickers Hydraulic Controls are high pressure oil hydraulic controls that are so widely used because they do the job dependably, smoothly and accurately... no matter how severe the service. They are insensitive to shock and vibration yet light in weight... easy to adjust... admirably suited to aircraft needs.

VICKERS
 Incorporated

1400 CARMAN BLVD.
 DETROIT, MICHIGAN



ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1923

ORIGINAL PHOTOGRAPH, U. S. ARMY AIR FORCE

THE AVIATION NEWS

Washington Observer

INVASION—The one topic of conversation in Washington is the invasion. When the word came through last Tuesday that troops had begun landing, everything else became secondary and will remain secondary until the picture begins to clear. Many things hang on the outcome of the landings—budgets, production, reconversion, surplus goods, food supplies, every factor in American life. Until the progress of the campaign of liberation emerges more clearly, Washington can be expected to be completely blocked out as a news source for anything but those matters affecting the troops on the continent.

RECONVERSION DELAY—With the invasion actually in progress, some government officials dealing with peacetime economy are showing signs of increasing impatience over the lack of a definite program such as outlined in the Haruch-Kincock report and which at the time of its issuance some months ago was almost unanimously accepted as pointing the way back to normal operations. There are even some hints that unnecessary production is being continued in some lines.

UTILIZATION—WPA officials say that the goal of the planning and preparations for peacetime enterprise may be summed up in four words—full utilization of resources, which, if attained, would bring some degree of prosperity to every group in the economy. Today about 45,000 manufacturing concerns hold direct government war contracts, and the war

work of about 50,000 additional firms is limited to subcontract operations. WPA officials point out that in order to make full use of their resources, these concerns will need a big volume of civilian orders before war contracts are cancelled in bulk.

AAP LEASES—Army Air Forces has begun studying the question of leased facilities, and where possible will cancel leases and move activities into government-owned installations. Air inspectors have been told to forget out situations where this can be done.

GLIDER SURPLUS—One of the many surplus problems before the services is disposal of scores of small two-place training gliders. Many have never been uncrated. Inspections have gone out from Washington for an inventory, as a result of reports made by at least one association for information on number and bid procedure.

POST-WAR REPORT—The report of the Woodrum Post-War Military Policy Committee on the recent hearings on unification of the armed services may be issued this week. The action of Senator Lister Hill in introducing a bill embodying the Army's views on a single department has complicated matters, and the report of the Woodrum Committee probably will deal with the pressure for immediate action in some detail, particularly at this time of great

Paratroopers go "on the double" into an awaiting transport plane



VITAL CONTROLS ARE C-D INSULATED



THIS DILECTO

part is used to identify connections as well as to insulate them. Good mechanical and electrical properties are needed.



THIS VULCOID

part must resist carbon deposit from arcs as well as prove equal to mechanical shock and also retain its electrical insulating properties under adverse conditions.



THIS CELORON

part had to be of a material that could be molded to shape, that was a good insulator and strong.



THIS DILECTENE

part must remain stable over a wide range of frequencies and in spite of humidity conditions.



THIS DIAMOND FIBRE

part had to be of a material that could be deep drawn, that was resilient, tough and oil resistant.

CONTINENTAL DIAMOND manufactures Electrical Insulating Materials that are engineered to meet specific electrical, as well as mechanical and thermal conditions. That's why C-D products are used in all types of Military Equipment where possibility of failure must be reduced to a minimum.

DISTRICT OFFICES: New York • Cleveland • Chicago • Springfield, S. C.
West Coast Reps., Richmond, Va., San Francisco • Sales Offices in principal cities

Gentlelental - Diamond FIBRE COMPANY

Established 1895...Manufacturers of Insulated Plastics since 1917—NEWARK 4 • DELAWARE

VOLUME 1 • NUMBER 66

Aviation News
McGraw-Hill Publishing Co., Inc.

June 13, 1944

New Concept of Tactical Air Force Gets Supreme Test in Invasion

Vast numbers of planes open big offensive, providing air cover, paralyzing Nazi communications and furnishing extra fire power for ground troops.

By WILLIAM G. KEY

The evolution of air strength in the European theater from a strategic role to support of invading ground troops and to leading of air invaders is showing the world a developing new concept of power and tactical use of aviation.

Probably no other great troops nor the Germans were prepared for the first great burst of tactical air power used in the early days of the landings, with 13,000 sorties and more daily isolating the chosen invasion points and routing the Luftwaffe as tightly down as humanly possible.

Restricted—Not too much detail will be released for some time, both for reasons of security and because the air forces are too conscious of the titles of public opinion now to do more than turn back a corner of the curtain. There will be no Cassio battles to blow up. But it can be said on the basis of information from high Washington sources that nothing comparable in the tactical use of air power has ever been seen before.

High air efforts in Washington say the Luftwaffe is nothing but a shell, although they do not minimize its strength. It has power to strike back desperately and dangerously. But the important factor is the eyes of authorities in this country is that Allied strength can be kept at a peak and the Germans cannot replace their losses if they meet the challenge.

Objective Air Control—It can be said that the goal of the airman is command of the air—not supremacy, but command such as that achieved in Italy where the tests of air power against air strikes power were completed. If the

Luftwaffe can be brought to battle, it can be destroyed. If a command, then Allied tactical air can be used to immobilize German reserves and wreck communications. In either event the objective is reached.

It has been possible to get from AAF charts an authoritative picture of the walloping of the tactical air force that has been largely kept under wraps in England. Allied tactical air, both around fighter-bombers, mediums and air-borne troops, has been brought into play through six major phases.

Strategy—The first phase was carried out by strategic air, de-

stroying factories and drawing off fighter strength to enable tactical air to carry out the second phase of systematically destroying airfields in the invasion area and prepare for the third phase of hammering vital rail and highway key points. In the fourth phase, tactical air attempted the destruction of telephone centers and radio stations, this phase culminating in the hours immediately before the invasion with the ruthless smashing of radar installations.

During all these phases, tactical air maintained the initiative. Then came the fifth phase and the extremely difficult task of providing cover for the landings when the initiative would swing over to the Germans. How well this was done, even in violation of the initiative, is one of the really great aerial operations of the war. Overwhelming strength, relatively concentrated landing operations and brilliant direction enabled tactical air to provide cover for ship landings and air-borne landings and at the same time swing over with its air-borne units to the sixth phase, that of isolation of the bal-



C-47's and Gliders Packed for Invasion: Manned Douglas transports and gliders line an English airport in preparation for the greatest movement of air-borne Army elements ever launched in warfare. C-47's are in the two outside rows, gliders in the center.



Glider Assembly Base in England In the open fields of England, so great was the air strength that production there, that gliders were taken from their shipping boxes and assembled for their single trip across the channel. In the background are the completed gliders, while in the foreground they are shown in various stages of assembly.

linefield from local and distant reinforcement. This will be the final test, and the results may not be known for weeks or months, but the brilliant record attained in the earlier phases is heartening.

► **Cosplay**—There is a corollary to the sixth phase in the giving of direct ground support, an extremely difficult operation from which not too much should be expected. It is given, chiefly to fighter-bombers utilizing a highly developed communications system, but the air technicians feel that the greatest benefit can be obtained by concentration of strength against areas beyond the zone in which troops are deployed in contact. There has been a shift to the southwest, that ground artillery should be relied on and required to supply the direct ground support.

This ground support is being handled through headquarters of armies and not in any lesser echelons except in particular airborne operations. Air liaison teams operate in the forward areas and channel requests for support through ground command channels to the headquarters of the armies. At these headquarters, an air commander works in intimate cooperation with the ground army commander. The ground command evaluates the requests that have often-lagged and demonstrates target priorities. The attacks then

are ordered by the air units to the extent that planes are available. The extent to which the Germans are prevented from capitalizing on the advantage of their communications network in France will be the true measure of the already tremendous contribution of the Allied tactical air force.

Canada Main Source Of Empire Airmen

Ottawa says it furnished 25 percent of RAF's pilots in Europe and Mediterranean.

Latest figures released as activities of the Royal Canadian Air Force show there now are 42 RCAF squadrons on actual operations, including bomber, fighter, reconnaissance, coastal command, night fighter and intruder groups. Originally three Canadian squadrons went overseas as units.

There are about ten times as many RCAF air crewmen scattered through the RAF as there are in the 42 squadrons Canada now has and has been for months, the largest and principal producer of air crew for all the British Commonwealth forces.

► **32 Percent Canadian**—The report made at Ottawa says 25 percent of all air crews in European and Mediterranean areas under

AVIATION CALENDAR

June 10-12—Airport Management Conference, Fort & M. Collins Station, Tenn.
June 11-16—Personnel Organization Meeting, Flight Officers Association, Washington
June 12—International Conference of Mechanical Engineers, Wilkes-Barre, Pa.
June 13—West Virginia Planning Board Air Force Committee, Charleston
June 14-15—American Association of Airport Executives, Ford Sherman Chicago
June 14-15—Air Traffic Conference of America, Aeronautical Society, New York
June 15-16—Joint Airport Users Conference, National Aeronautics Association, Washington
June 15-16—National Business Meeting, National Aeronautics Association, Boston
June 16-17—Joint Airport Users Conference, National Aeronautics Association, Boston
June 17-18—National Council of American Aviation, American Aviation, New York
June 18-19—National Council of American Aviation, American Aviation, New York
June 19-20—National Council of American Aviation, American Aviation, New York

British tactical command are Canadian men enlisted and trained in Canada. Canadian radio technicians, comprising 45 percent of the RAF mechanics establishments are stationed throughout RAF detachments.

In Western Hemisphere operations, the RCAF has shown as many squadrons as in overseas operations. They are being released for overseas service as the submarine situation improves. They served with the United States command during operations off Alaska.

AAF Overseas

More than 17,000 combat aircraft of the Army Air Forces are in overseas theaters, operating from 732 airfields, statistics released by the War Department reveal.

Slightly less than half of the total AAF personnel—3,307,000—has been sent overseas, manning 611 bases outside of the continental United States. In addition to airfields, the bases include radio and weather stations, hospitals, depots and storage bases for combat units and for the AAF.

Nazi Strength

The Germans can throw a maximum of 1,500 fighters into the fighting on the Western Front, informed sources believe.

Bomber strength available for action against the invading troops is placed at about 500 drop-plane planes.

Indications that Nazi transportation in the Netherlands border had been seriously disrupted were early reports that some Junkers transports had been shot down in the area.

Budget Needs for Fiscal 1945 Sharply Under 1944, Says Arnold

General tells House group AAF's requirements for coming year are "decidedly lower in number and considerably lower in total weight" than 1944 estimates.

Alphane requirements shown in the budget estimates for the fiscal year 1945 are, according to Gen. H. H. Arnold's testimony 'decidedly lower in number and considerably lower in total weight from those in the fiscal year 1944 estimates.'

Gen. Arnold told a House Appropriations Subcommittee that since some of the 1944 procurement will carry over into next year, no appreciable reduction in the air-frame-weight production is contemplated at this time.

► **Weight Increased**—The weight of airplanes produced, as he pointed out, has steadily increased and the total planned production for fiscal year 1945 is 544,000,000 pounds of which 445,000,000 pounds are included in this estimate.

He disclosed that in order to obtain maximum production on the very heavy bombers, it was necessary to order a sufficient number to provide production until De-

cember 1945 or six months longer than was necessary in other types. He added that since this production is well under way, only an additional six months' production is included in these estimates and the emphasis is on combat planes.

► **Peak by June 16**—The air forces will have in the main, Gen. Arnold said, built up to their planned strength by June 30 of this year and added that it was well to note that "we have not as yet obtained our maximum striking power and as tremendous as this power is today we have not yet reached our peak."

Gen. Arnold set AAF requirements for the fiscal year 1945 at \$12,856,774,500. He added that savings were expected of about \$11,000,000,000 which, with certain other minor adjustments, may be applied against these requirements and to reduce necessary appropriations to \$1,810,393,899 net.

The total requirements were

broken down roughly as follows: Personnel in all parts of the world, \$500,990,000; travel and transportation, \$81,000,000; contractual services, \$633,660,000; supplies, \$1,261,000, and equipment, \$9,816,064,000.

► **Provision for Modification**—The estimates show additional requirements of \$8,359,000,000 for airplanes, including spare engines and spare parts, an estimate of \$200,000,000 for new aircraft modification, \$1,459,250,815 for maintenance and operation.

In view of the airborne operations in connection with the invasion, the testimony before the committee at Maj. Gen. Oliver P. Echols on glider production assumes greater significance. The budget estimates for gliders was set at \$60,900,000, a figure which Gen. Echols said are frankly estimates.

He commented that most of the gliders built to date experimentally, have been the smaller eight-place craft and added that "war people are now looking toward more intensive use of gliders over greater distances in many parts of the world and they want gliders to carry greater loads."

► **Future of Helicopters**—In connection with the helicopter, Gen. Echols said "we are still enthusiastic about helicopters and their fu-



BRITISH HONOR AMERICAN ENGINEERS:

The British Institute of Mechanical Engineers conferred honorary membership on Gifford Wright and Dr. Harvey N. Davis, past president of the American Society of Mechanical Engineers and director of the Office of Production Research and Development. Presented are (left to right) William L. Burt, chief of the British Institute; Robert M. Gates, Assistant Secretary of the Navy, representing the

Wright, who was unable to be present, Lord Halifax, British Ambassador, who made the presentation; Dr. Davis and A. C. Herlihy, member of the Council of the British Institute. In return Dr. Gates extended to Lord Halifax and Mr. Herlihy an American certificate of honorary membership. Sir Dr. Harry R. Ricardo, British combustion engineer and president of the British Institute.

tare. We are proceeding slowly because so much of the aerodynamic and materials research connected with them is pretty much empirical."

The production of helicopters, he said, had not been quite as rapid as anticipated, explaining that "there is a certain amount of minor vibration which has taken some time to solve." The budget estimate for helicopters which called for 1,200 additional such craft, was reduced by \$63,000,000, but the total helicopter estimate was not given in the testimony.

FEDERAL DIGEST

10-Hr. vs. 8 Hr. Day Studied By WPB

Advantages of both listed in memorandum issued by War Production Board of week's activities in war and U.S. agencies.

By MARY PAULINE FERRY

The ten-hour work day with two-shift operation is contrasted with the eight-hour, three-shift schedule by the War Production Board's Office of Manpower Requirements in a memorandum circulated for the information of war production officials. However, members report that, with the limited information available, specific conclusions cannot be reached.

Improved production, due to better supervision despite less in total factory operation time, is one of the chief advantages claimed by proponents of the two-shift schedule. The OMB points out that often supervision is spread too thin when attempting to maintain three shifts. However, the chief counter-objection has been that the increased fatigue, brought about by the longer working hours, frequently causes absenteeism, loss of efficiency and more sickness and accidents among the workers.

War Production Board reports that wherever shortages have so retarded plant output production that manufacturers are now working against a 40 percent backlog of orders, despite the result of overall cutbacks. Production of petroleum in U.S. controlled plants in Canada is far behind schedule and a survey of all plants in the Dominion is planned.

Production programs for fractional horsepower motors are being met. However, additional motors probably will not be available

for civilian use in view of the large military orders with which the industry is faced. The advisory committee recommended that the CMB allotment application procedure be simplified with respect to such critical common components as electric motors.

Federal Communications Commission ordered last week October 1, 1944 the Commission's radio stations to reduce their station hours of operation to 15 minutes, of the Commission at least once during the hours before 10 p.m.

Army Air Force has established a new "Production Control" committee which will coordinate the activities in production of aircraft, engines, and other military equipment. The committee will be headed by the chief of the Air Corps, and will be composed of representatives of the Army, Navy, and War Production Board.

War Relocation Authority has ordered the evacuation of Japanese-Americans from the War Relocation Authority. The order is being issued to all Japanese-Americans who are not citizens of the United States.

Douglas Financing On 3-Yr. War Basis

Contract with nation-wide syndicate for \$75,000,000 revolving credit.

That Douglas Aircraft, Inc., expects to be in peak-time production within three years is indicated by the company's contract with a nationwide banking syndicate for a three-year, \$75,000,000 revolving credit.

Reith V. Hunt, Douglas vice-president and controller, who disclosed the credit fund agreement, said the agreement was restricted by the agreement from including more than two syndicate participants—National City Bank of New York, syndicate managing agency, and Security First National Bank of Los Angeles, agent. However, other member banks are Chicago, Tulsa, Oklahoma City and San Francisco.

Renewal of Agreement—Financial "betrayal" before Douglas hopes for a continental production boom light before 1947 are shown by the fact that the revolving fund is an expanded renewal of a 1943 revolving fund agreement giving the company banking credits up to \$49,000,000.

Under terms of the recent agreement, Douglas is to maintain a \$25,000,000 working capital. Current borrowings against the fund are \$6,000,000. Douglas pays 2 1/2 percent interest. Funds loaned are secured by a combination fee of 1/4 of 1 percent per year on the unsecured portion of the commitment.

House Group Urges Wasp Recruiting End

Civil Service Commission advises that surplus plane pilots be used for duties assigned to women.

Of 325 Waps assigned to ferrying duties with the Air Transport Command, only three are qualified for handling four-engine bombers and transports, eleven for two-engine bombers and fighters, 66 for twin-engine transports or cargo planes, the House Civil Service Committee report on the program of Women's Air Service Pilots reveals.

The balance of 322 Waps are assigned to utility flying, target towing and various other routine jobs.

Ash End of Recruiting—Because of these and other factors, the Committee concludes the expansion of the Wap program was not justified and recommended that recruiting for the Waps be halted immediately.

The report says all three of the Class 3 Wap pilots were qualified aviators with between 1,000 hours each before they joined the original WAFS. A fourth Wap of long experience is eligible for the Class 3 rating. Five of the 11 in Class 2 have twelve engine hours and eight are in the original WAFS and the other six had more than 300 hours before joining the Waps.

High Cost Close—The House Committee reported \$60,000,000 in cost at the Wap school at Sweetwater and estimated that the cost of this group to the country was \$66,500, which was a complete loss in contrast to elimination of men trainees who can be utilized for other Army duties.

It does recommend that use of Waps already trained and in training be continued, and that provision be made for hospitalization and insurance for this group. It also urges that Waps in Classes 3, 4 and 5 be given salary adjustments in accordance with experience and responsibilities. All Waps, whether flying single-engine trainers or four-engine bombers, are paid \$250 a month after graduating from Sweetwater. The Committee also urged that the surplus of experienced pilot personnel available from cancellation of military school programs and the CAA-WTS operations be utilized immediately to perform the type of work envisaged by the War Department for the Waps.

Termination Article Adopted to Speed Subcontractor Settlements

Summary of week's developments in formulation of policy and program for post-war industrial mobilization.

The Joint Contract Termination Board last week moved to speed up the settlement of subcontractors' claims by inserting a uniform termination article for fixed price subcontracts. The article was placed into effect immediately.

Amendment of the subcontractors' termination article is only one of several demobilization developments of the week. Elsewhere these actions transpired:
■ Bernard M. Boruch and John M. Hancock, co-authors of the War and Post-War Adjustment Policies Report, were said to have submitted their resignations in protest over failure of the government to procure adequately for reconstruction.
■ The House Rules Committee gave a rule to the contract termination bill, enabling it to come to the floor certainly by next week.

A surplus digest bill, based on recommendations of Administrator Clayton, was being prepared for introduction in the Senate.
■ Secretary of Commerce Jesse Jones warned against permitting the tax consequences of new plants to fall into the hands of big business after the war.

■ The Joint Contract Termination Board resolved for study the proposal of Surplus War Property Administrator Clayton that many war plants be completed, even after evacuation, on the ground that the completed item could be disposed of more economically than an incomplete one.
■ SWPA attacked the tremendous storage problem by establishing a Space Control Committee and regional sub-committees.

The War Production Board, it was revealed, is making an effort to adjust its controls and regulations so as to avoid blocking the liquidation of war surpluses.
■ The War Department repeated that no military property would be sold by the Army. Buyers would be told by Public Relief to the Treasury Department.

The SWPA announced that already Government-owned surplus amounting to "several hundred million dollars" are accumulating in manufacturing plants as a result of contract cancellations.

Of these, the most significant is

the adoption by the Joint Contract Termination Board of the subcontractors' termination article. This is described by John M. Hancock, chairman of the Board, as "a major step in the speeding of payments to subcontractors whenever their war business is canceled, freeing their capital for other war work and for the speedier reconstruction of civilian production."

■ Shorter Document—The new "subcontractors' termination article" supplements the uniform Termination Article for prime contracts, which was made effective Jan 8 by Director Byrnes on recommendation of Bernard M. Boruch and Mr. Hancock. While generally applying the same principles of settlement to subcontracts as prime contracts, the subcontractors' article is a much shorter document. Mr. Hancock explains that the subcontractors' article had been made brief—eight paragraphs—so that it can be inserted more easily into the hundreds of thousands, and perhaps millions, of purchase orders and subcontracts that will be affected.



FUEL TANKS FOR FORTS:

Three self-sinking fuel cells for Flying Fortresses will be placed on the bombers for their swarms over Nazi-held territory.

In reporting a rule for the House Judiciary Committee's contract termination bill (the House version of the Senate-approved S. 1718), the House Rules Committee virtually assures that the bill will come to the floor of the house early next week for what may be final passage.

■ Clayton Bill—The surplus disposal bill which will emerge from Mr. Clayton's recommendations will supplant the 14 disposal bills now pending in Congress and will launch legislative action on this topic. Unless blocked by unforeseen developments, the "Clayton Bill" probably will be introduced next week in the Senate and referred to the Senate Military Affairs Committee.

Discussing the post-war problems of the Government and industry, Secretary Jones cautions against disposing of Government plants as "surplus pieces," and declares:

■ Plugs Small Units—"It would not be to the best interests of the country if all our Government plants got into the hands of big business and thereby further increased monopolistic tendencies. We should not permit the war to further concentrate our economy in big units. The country is better off with smaller units, even if not always as efficient."

The War Production Board was

called on since time ago to assist, through its industry advisory committees, the Surplus War Property Administration in making policy decisions. Since all sales of Government property must now be made within the pattern allowed by WPB regulations, that agency finds itself in the position of being able seriously to delay disposal if its adjustments of controls are not promptly made.

Sees Flying Boat Using Land Ports

Martin sees post-war significance in improved gear that permitted *Mariner*, down in dry lake, to take the air again.

The take-off of a Martin *Mariner* from the bed of a dry lake in Arizona, where it had been an emergency landing, is only a preview of a day when flying ships will land and take off from inland airports, Glenn L. Martin said last week in talking that methods now being worked out to widen the scope of the flying boat's use.

Martin said that, if the *Mariner* had landed in green grass or a hayfield, it might have been flown out without incident, the grass acting as a cushion against the hull. This may indicate the trend of development hinted at by Martin in his statement, in which he refused to elaborate on methods contemplated for inland operations. Martin pointed out that he had taken low-powered draft planes off grass as early as 1912.

Take-off—The dry lake take-off was accomplished by using reinforced bending gear, later dropped

with pressure beams pulling the shackles, permitting a safe landing in the water at San Diego. The Navy first contemplated dismantling the *Mariner*, which was forced down on a cross-country flight when an oil line broke. However, it was found that the hull had not been damaged in the difficult landing, that the cost would be tremendous if the dismantling were to be carried out, and that it would be entirely possible to accomplish the unprecedented take-off.

A special crew repaired the damaged right wing tip, aileron and fuel and smoothed a runway for the attempt.

Lead (Capt. L. A. Flynn, veteran Navy flying boat pilot, took the plane off and landed near San Diego without incident.

The cost of the repair was approximately two percent of the cost of the ship.

WEST COAST REPORT

Invasion Spurs

Post-War Planning

Plan, plan, buy with heavy schedules, expected to withhold announcements till after success of battle is assured.

Feeling that they must begin emphatic declarations of post-war plans grows among West Coast airplane builders.

They are spurred by increasing gossip at Eastern industry's (other than aircraft) rapid preparation for civilian production, the expected signing of production and marketing contracts to become effective

live when peace comes, and the worrying of stockholders who have placed plants have done little in locating specific markets for what they hope to build.

Division Results Available—However, the aircraft industry generally, if West Coast attitudes in a discussion, will remain quiet until after the invasion operations are definitely determined.

This is a definite, if elementary, policy now recognized in executive conferences by aircraft leaders who feel it will be in bad taste for them to talk post-war in the midst of a war crisis. More are tending to watch for, on the West Coast, when aviation leaders can meet.

Design and manufacture of light metal buses and railway cars, even complete, integrated trains, development of light metal and even light steel structural shapes.

Any taking off of visionary interest in the possibility of developing, in the face of aggressively established Eastern competitors, markets for household goods (such as washing machines) and automobiles.

But don't look for total abandonment of the automobile production idea.

Post-War Planes—What Western manufacturers will have to say about the post-war planes they will build may be retrieved temporarily by military production contingencies—and sparing for the opportune moment when announcements will be certain to gain greatest public recognition of confidence in the future.

Look for Lockheed, Northrop, Douglas and Boeing to come out with announcements of planes that will dwarf any they now are building, and that will approach in size the 150-passenger (400 troops) Consolidated *Vulgar* project.

A-20 CANCELLATION—Dulcification from their present jobs of 8,900 Douglas Aircraft (Santa Monica, Calif.) workers in the next three months by A-20 contract cancellations is expected to be a boon to "labor hungry" aircraft and parts plants—S. B.

Hanley Assumes Post

Major Gen. Thomas J. Hanley, Jr., formerly commanding general of the AAF Eastern Flying Training Command at Maxwell Field, Ala., has assumed command of the China-Burma-India Air Service Command. He succeeds Brig. Gen. Robert C. Oliver, whose new assignment is unannounced.

Progress of Invasion Watched For Effect on Plane Production

Top officials in Washington maintain that no immediate change in output rate or employment is to be expected beyond revisions already planned.

By SCOTT HERSHEY

The progress of the invasion of Western Europe is a highly important factor in the immediate future of aircraft production and upon the development of that vast operation will probably depend in a great degree the course of the aircraft manufacturing industry in the next few months.

Industry observers watching the military situation from that viewpoint are taking all elements into consideration, including Pacific operations, which naturally will be intensified when the outcome of the fighting in the European theater is determined without question, for possible effects on the aviation industry.

Schedule Changes—The trimming of production schedules on some models and outright cancellations in others are trends which cannot be overlooked although production officials in Washington cannot now change in expected production or production effort and that neither output nor employment will suffer as a result.

The production emphasis is pointed up by the War figures which show that for the first time, all bomber plants met or exceeded their schedules. This includes the new, more heavily armed, four-engine, long-range bomber, Boeing's B-29 Superfortress. The industry turned out more B-24 Liberators and more B-17 Flying Fortresses, than in any previous month.

Transport Output—In addition, over-schedule production also was realized in the much-needed transport aircraft category and it was learned that there will be renewed emphasis on the output of Douglas C-54's.

Aircraft production exceeded over-all schedules by two percent last month, with 5,903 airplanes of all types produced.

While the unit output was not a record—6,118 were produced in March—it was two percent above schedule and in terms of aircraft weight, including spares, it was a new high, production, with a monthly total of 184,000,000 pounds.

Large Types Stressed—As Charles E. Wilson, chairman of the Aircraft Production Board, commented that "this reflects, to a notable extent, the increase in urgent, needed large types, and a corresponding decrease in less needed smaller types, particularly trainers, which represent only eight percent of the total number of aircraft produced and only two percent of the total aircraft weight."

It was disclosed that the Douglas plant at Tulsa soon would discontinue output of B-26 bombers in a new plane now in production, the A-26, details of which are still restricted, while Consolidated plants at Fort Worth and San Diego would stop production of the Liberator and turn "to something else."

Willow Run—Production of B-24 Liberators at Ford's Willow Run plant is now at an average rate of about one an hour and, in connection with the discontinuance of Liberator production at Tulsa and Fort Worth, Willow Run will send up its output of knock-down planes within a few weeks. These

would be shipped to the Tulsa and Fort Worth plants and are assembled on the four primary lines in the same manner as are the components of the planes intended for the plant's five final assembly line.

Overall, Wilson said, the production trend for the next few months is approximately horizontal. There is no great change in number of planes scheduled and as has been noted before, aircraft weight will step up slightly from month to month.

Plane Industry—Wilson stressed the fact that the aircraft industry is doing up maintaining increased and changing schedules of strategically important types and reaffirmed his confidence in the industry's ability to keep pace with these requirements. This spells a continuing but job ahead for the manufacturing industry and associated manufacturers with intensification of the trend toward bigger bombers, long-range fighters and certain specialized planes, as opposed to short-range fighters, certain types of medium bombers.

Adjustments in contracts to meet changing combat requirements and cancellation of one model to make way for another or to permit concentration on one type instead of several—may tend to confuse the layman who will hear of layoffs on the one hand and shortages on the other.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

knock-down planes have been shipped to the Tulsa and Fort Worth plants and are assembled on the four primary lines in the same manner as are the components of the planes intended for the plant's five final assembly line.

Overall, Wilson said, the production trend for the next few months is approximately horizontal. There is no great change in number of planes scheduled and as has been noted before, aircraft weight will step up slightly from month to month.

Plane Industry—Wilson stressed the fact that the aircraft industry is doing up maintaining increased and changing schedules of strategically important types and reaffirmed his confidence in the industry's ability to keep pace with these requirements. This spells a continuing but job ahead for the manufacturing industry and associated manufacturers with intensification of the trend toward bigger bombers, long-range fighters and certain specialized planes, as opposed to short-range fighters, certain types of medium bombers.

Adjustments in contracts to meet changing combat requirements and cancellation of one model to make way for another or to permit concentration on one type instead of several—may tend to confuse the layman who will hear of layoffs on the one hand and shortages on the other.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.

Nevertheless, as pointed out by the Aircraft War Production Council, the armed services still require warplanes in large numbers.



"Mariner" Repaired on Desert For Dry Docked: Navy and Martin technicians repair the wing tip, aileron and fuel of a *Mariner* forced down in the Arizona coastal lands. The ship later was "floated" on beaching gear and took off as an improved runway.

Airlines Get \$189,054,843 For ATC Contract Work to May 1

Figure is approximately half of \$369,105,987 total obligation, according to testimony in connection with Military Establishment Appropriation Bill for the fiscal year 1945.

The airlines have received \$189,054,843 to May 1 of this year for their Air Transport Command contract work, out of a contractual obligation of \$369,105,987. The figures were given in connection with testimony before a House Appropriations Subcommittee in connection with the Military Establishment Appropriation Bill for fiscal 1945, starting July 1.

Budgetary estimate for the first fiscal year was \$88,711,175, or around \$16,000,000 less than for the current fiscal year ending June 30. Brig. Gen. C. B. Smith of the Air Transport Command explained that cost per mile in the new estimate was lower, due to economies in crew and aircraft utilization, and that estimate of aircraft to be operated had dropped from 300 in fiscal 1944 to 226 in 1945.

Rebureaucracy—Of the more than \$65,000,000 in the estimate, he said, 94.85 percent represented actual reimbursement cost, 1.35 percent represented fees. "Out of the \$68,712,000, there is \$1,355,980 for fees—1.5 percent."

Principal ATC services, Smith said, are those between the United States and the United Kingdom. He also told of "very comprehensive service" to Africa, India and China, across both North Africa and through China, and South America and Central Africa; service from the United States to Alaska, a "very extensive network" to New Zealand, Australia and islands in the southwest and central Pacific, and the Pacific across the mountains of India and China. In addition, ATC operates "some 30 or 60 airplanes" within the United States.

Use Civilian Personnel—Gen. Smith explained that the aircraft are furnished to the airlines, but that the air carriers use civilian personnel entirely in operating them. With the tables on contracts, it was stated that six of the aircraft are owned by commercial firms, 124 by the government.

These tables, giving the status of airline contracts as of April 30, 1944, showed contracts prior to

Dec. 31, 1943, on which obligations totaled \$127,321,323 and expenditures \$72,539,632. New master contracts listed for Jan. 1 to June 30, 1944, totaled \$66,920,577 in obligations and \$64,344,066 in expenditures. Third part of the table, on new master contracts for fiscal 1944, showed obligations of \$158,823,471 and expenditures of \$52,844,215.

Obligations and Expenditures—Contract as they were listed in this last group showed the following items (first figure obligations, second expenditures):

All American Aviation, Inc., \$130,150 obligations and \$108,660 expenditures; American Airlines, \$11,325,345 and \$4,521,041; Braniff Airways, \$4,321,425 and \$182,349; Chicago and Southern Air Lines, \$2,095,525 and \$1,334,782; Colonial Airlines, \$1,053,789 and \$504,626; Continental Air Lines, \$1,324,850 and \$708,915; Delta Air Corp., \$1,302,840 and \$389,553; Eastern Air Lines, \$11,492,154 and \$978,130; Inland Air Lines, \$978,130 and \$74,990; Mid-Continent Airlines, \$1,462,355 and \$118,689; National Airlines, \$1,541,148 and \$777,931; Northeast Airlines, \$4,877,395 and \$326,237; Northwest Airlines, \$16,886,921 and \$7,446,076; Pennsylvania Central Airlines, \$4,399,780 and \$532,583; Transcontinental & Western Air, \$16,934,393 and \$12,312,080.

Air Ambulances

The AAF Medical Services report evaluation of 173,927 American sick, wounded and injured personnel during 1943, with only seven deaths in flight. This is an average of one for every 13,775 patients. The total included 361,241 medical evacuees by ground Air Force.

Many of the cases, OWI said, were so serious that other transportation means or delay in the air removed to base hospitals would have added materially to the death toll.

\$71,080; United Air Lines Transport, \$33,333,303 and \$6,760,567; Western Air Lines, Inc., \$1,745,181 and \$375,896; Pan American Airways, \$20,567,547 and \$988,153; Pan American Airways, \$1,745,181 and \$1,355, Airways Transport, \$20,006,000 and \$253,699; Southwest Airways Co., \$235,624 and \$124,043; Consolidated Vultee Aircraft Corp., \$7,549,790 and \$1,745,578; Beazell Airways, Inc., \$5,353 and \$5,353; Eastern Air Lines, Inc., \$96 and \$69; Based on Post-Continental, \$6 and none; American Airlines, Inc., \$4,682 and \$4,003; United States Transport Co., \$107 and \$127; Eastern Air Lines, Inc., \$7,133 and \$7,758.

Randolph Heads CFC

Washington's new Congressional Flying Club elected Rep. Jennings Randolph of West Virginia as president at its organizational meeting last week. Rep. Melvin J. Mass of Minnesota was elected first vice president and Fred Bardeley of Michigan, treasurer. Secretary is Mrs. Allene Danner, of the office of Rep. McKee of Louisiana.

The group, which has 25 members, also adopted constitution and bylaws. Of the 65 at the meeting, more than half were members of Congress.

Recruit 17-Yr.-Olds

The Army Air Forces on June 1 resumed recruiting of 17-year-olds to supply a reserve of trainees for air crews. Boys for youths joining the enlisted reserves are expected to come in the fall, from those reaching their 16th birthday.

Yields less than 17 years, nine months with high school diploma, will be eligible for army from these state months in the Army Specialized Training Reserve program.

Gen. Wilson Named

War Department announces appointment of Brig. Gen. Donald Wilson as Deputy Chief of Air Staff, succeeding Brig. Gen. Hoyt S. Vandenberg. General Wilson has been Chief of Staff of Allied air forces in the Southwest Pacific since September, 1943. General Vandenberg is now Deputy Commander-in-Chief of the Allied expeditionary air force in England.

New Constellation In Production

Undisclosed number of C-69s reported ordered by AAF.

The record-breaking C-69 Constellation transport is now in limited production at Lockheed, with all planes going to the Army when completed. Production rate is restricted.

An undisclosed number of C-19s are on order to the AAF, including those ordered by Transcontinental & Western Air and Pan American.

Short-Haul Operations—Robert E. Gross, Lockheed president, said test flying had brought out an unexpected versatility in the airplane and contended that it "proves quickly adaptable to economical short-haul duty and in long-range ocean and continental crossings."

Some observers had held that the Constellation, while made to long-range operations, would not be economical in operation on other bases and consequently had few potential limitations.

Set New Record—Flown by TWA, a Constellation prototype recently set a new transcontinental



"Constellation" in Production: Lockheed's record-breaking C-69 is now in limited production with all planes going to the Army, Transcontinental & Western Air and Pan American among their order rights. The planes shown in this section of the line are military personnel transports which will be operated by the Army Air Forces.

transport record of six hours, 36 minutes from Burbank to Washington, at an average speed of 330 mph, with less than 17 percent above. The military model now in production seats 69 passengers and has alternative sleeping accommodations for 32, plus berths for a relief crew of four.

Post-war models, as previously noted, will carry from 32 to 64 passengers, in addition to a crew of six.

Idaho Flyers Map Six-Point Program

Group formed with view to development of plan for postwar expansion.

Idaho aviation enthusiasts have formed an organization and drafted a tentative six-point program. A formal underling, said William P. Hughes, Lewiston, Idaho, president of the group, which will be known as Idaho Aviation Association, is in the approval of existing survey facilities, with a view to expanding both interstate and intrastate activity.

Other immediate objectives include:

- Investigation of needs and practicability of flight strips and landing strips in the remote areas.
- Establishment of policies concerning airport construction and maintenance by local, state and federal agencies.
- Zoning of airports.
- Coordination of air transportation with highway and other forms

with emphasis on highway access roads to airports.

Financing construction and maintenance, including use of funds raised from the aviation industry exclusively for development of the industry.

Gen. C. A. Battifora, addressing the organization meeting in Boise, state capital, said state aid could be increased if the association sponsors laws at the next legislature to enable use of tax monies collected from air activities to be spent in aeronautical developments.

Funds Collected—The governor reported that approximately \$28,000 collected by the State Department of Aeronautics will be returned to the state's general fund at the end of 1944. The Department, he explained, can spend only by legislative appropriation.

Paul Morris, regional director of CAA, Seattle, outlined the future of private flying, predicting that the pre-war ratio of 350 commercial airplanes to 27,000 private planes would be maintained after the war.

Air Marking

After more than three years of war, in which hundreds of airports have been built throughout the country, officials of Army, Navy and CAA recently agreed upon standardization of markings for airports under their separate jurisdictions. Differences weren't serious, but they caused some trouble, and modifications will be progressively helpful.

Piper Developments Watched For Hint of Post-War Pattern

Company's dominance of lightplane field and role in supplying aircraft to Civil Pilot Training program put it in strategic position for shift to peacetime production.

By BLAINE STUBBLEFIELD

Pilot-minded people, flight schools and base operators in this and other countries are watching developments at Piper Aircraft because when the war started it was, and it remains, the world's largest manufacturer of light airplanes.

Over 75 percent of the planes used in the Civil Pilot Training program were Pipers. In 1939, 1,376 Trainers were sold in addition to Cougars, bringing the total to 1,806 for the year.

This represented over half of all the non-military airplanes produced in the United States and 68 percent of all lightplanes. Production in 1940 again broke all existing world records at 3,014 planes delivered.

To date, Piper has built about 13,000 units in Trainers, Cruisers, and military types. No other single private plane manufacturer is within thousands of this mark.

First Under \$1,000—Piper was first to put an airplane on the market for less than one thousand dollars. Company engineers developed production line methods, some of which have been adopted by combat plane manufacturers to speed the growth of American air power.

The Army's Artillery has put into service several different makes of lightplanes, all of which are still in operation, but has recently standardized on Piper's L-4 for artillery fire control, observation and courier use.

With such a record behind them, Piper engineers, production men and salesmen are preparing to meet the opportunity and the challenge it presents.

In the past, Piper stuck to the principle that if personal flying schools and fixed base services were to expand and buy planes in volume, the fast cut and the operating cost of these planes must be adjusted to their utility value.

Formula—To make that price adjustment, and at the same time give safety and utility and durability was no easy task. Piper went a long way with it and is getting set to go further.

The company will stand by its old formula, which sounds conservative, but at the same time is determined to exhaust, experimentally, every new development that has reasonable chance of success.

As soon as materials are available, and when it will not interfere with production for the armed



W. T. Piper, President

forces, Piper will go to work on refined versions of its J-3 tandem Trainer and its three-seat Cougar for earliest possible delivery to the civilian market.

Initial deliveries will require only a few months from the starting time. Officials said they could produce about 75 units per month in addition to the regular military production almost any time that the Government is able to allot them the materials.

Low-Wing Design—Months ago the company released an artist's drawing of its Cub PT, a trainer version of Piper's experimental planes incorporating low-wing design and retractable landing gear. "It has ideal landing, take-off and stall characteristics," the company said, "yet its top speed of well over 130 mph makes it fast enough for advanced maneuvers, making it ideal for both early and transitional training periods."

This PT carries 60 gallons of fuel, which gives it over 600 miles for cross country. Company executives told the writer, during a conference at the Lock Haven, Pa., plant, that the low-wing PT, or a

Glass Cloth

NOW MAKES

PLASTICS

TOUGHER . . .
STRONGER . . .
MORE USEFUL!



for many special applications in military aircraft.

Another real value of this glass-reinforced plastic is the ease with

materials, now available in quantity, are invited to write: Owens Corning Fiberglas Corporation, 1892 Nicholas Building, Toledo 1, Ohio; in Canada, Fiberglas Canada, Ltd., Oshawa, Ont.

It may seem strange to think of glass adding great impact strength to any material. Yet that is just what happens when Fiberglas®—in the form of woven glass fibers—is used to reinforce certain plastics.

This combination has resulted in a new kind of structural material with some qualities which could mean of any other material now known!

Besides its surprising ability to absorb shock, this new Fiberglas-plastic material combines great strength (in tension and compression) with very low weight. It also has dimensional stability (neither shrinks nor swells) and has high fatigue resistance under vibration and other stresses.

All these features have combined to provide outstanding advantages



which it is fabricated into complex shapes and forms. Expensive dies and great pressure aren't needed. Molding is quick, accurate and clean.

Actually, there is much to learn about this new material. Some authorities have called it a new material of construction. The ingenuity of engineers and designers of the plastics industry will broaden its use.

Manufacturers and design engineers desiring more information regarding this revolutionary development or the reinforcing Fiberglas Textile

AN
Opportunity
FOR ENGINEERS
AND DESIGNERS



Plastics reinforced with Fiberglas Textile should be of great interest to designers, engineers and manufacturers seeking a stronger, lighter weight, more durable material. We're gladly helping you and we guarantee with Fiberglas Textile making this amazing new material.



W. C. Johnson
Chief Engineer

W. T. Piper, Jr.
Secretary

Harold Johnson
Plant Manager

T. V. Wolf
Vice-President

FIBERGLAS

© 1944 Owens Corning Fiberglas Corp.





TWIN ROTOR HELICOPTER DESIGN:

This sketch shows a new helicopter designed and being built by Arthur C. Schabus of Birmingham, Mich. As described in last week's *Aviation News* (page 15) the all-metal craft will have counter-rotating rotors and pusher propeller. The first model will have a 4-cylinder 100-hp Continental engine, and should cruise at 35 mph, and be able to reach 10,000 ft, its designer believes.

similar design, might be developed as a four-seat family model.

The company has several experimental designs, some in the air and some in the engineering shop, which they are not ready to show or discuss. They freely say, however, that they are sold on simplified two-control systems and on one-man non-spin features, both of which have been demonstrated for years in special safety plans, and they are ready to license any patents that cover whatever features they determine to use.

Three-Wheeled Carriages—Piper engineers are considering three-wheeled carriages for post-war utility design, and they have made extensive experiments with pusher power. They are trying to reduce noise and vibration, trying to make engines easier to get into and out of, and more comfortable to sit in.

Talk about price and utility in personal planes has increased lately, but Piper says safety must be greatly improved if many planes are to be sold.

Piper engineers are putting speed for down on the list of their objectives, and are concentrating on safety and ease of plane operation.

The writer has found several light plane builders optimistic on the post-war market. But Piper sees no prospect of a quick jump to volume sales. They feel the lack of utility, and competition by automobiles and other attractive durable goods will hold the plane market down for several years to come,

though it will be better than the start than it was before the war.

Texas A & M New Civilian Air Center

College speeds development of aviation activities in preparation for postwar expansion of private flying.

Texas Agricultural and Mechanical College is becoming a civilian air center of the Southwest as the college speeds development of air activities in preparation for post-war expansion of all forms of aviation.

Texas A & M has been quickly stepping up its aviation facilities under the direction of air-minded Cobb Gilchrist who, as dean of the School of Engineering, pioneered with a Department of Aeronautical Engineering in 1945 and now, as the newly elected president of the college, can widen the scope of the school's aviation interest. Acting dean of the School of Engineering is Howard W. Barlow, chairman of the Society of Aeronautical Weight Engineers, and a leading figure in aircraft engineering.

Conferences—The school has become the focal point of two important conferences this year and plans to expand this general service in the future. It was host to the Texas Aviation Conference a few weeks ago, attended by aviators from all over the country, and this week will conduct a three-day airport management short course

and conference attended by representatives from cities in Texas, Arkansas, Louisiana, Oklahoma and New Mexico. Among those attending the sessions Wednesday, Thursday and Friday will be public officials, operators, owners, managers, Chamber of Commerce executives and others.

Designed as an annual affair, the first meeting will be devoted largely to present problems of airport management, operation and maintenance. There will be group discussions of location, design, finance, construction, operation, maintenance and other problems of airports and auxiliary landing areas. Separate sessions will be conducted on the second day of the conference for cities having airport facilities and for these communities now without facilities.

Has Own Airport—The college has its own airport—Eastwood Field—built at a cost of more than \$1,000,000 and reputed to be the largest and finest owned by any college in the country. The only wind tunnel in Texas is at the school, built by students when the school was unable to purchase one. It is capable of testing aerial and plane models at a speed of about 100 miles an hour. Sixty thousand dollars already has been set aside for the purchase of a conventional, high-speed, high-pressure tunnel.

Despite its comparative youth, the Department of Aeronautical Engineering had 782 students in 1943. In addition, it has functioned during the war in civilian training courses, with 7,000 being processed, both at College Station and other Texas localities. The war training school at Geess Prairie, Texas, which supplied many of the workers for North American Aviation's plant, was sponsored and controlled by Texas A & M.

Flight Instruction—It is planned after the war to provide flight instruction for all students at A & M, as well as those in the Aeronautical Engineering Department. At the same time, the department will function as a research center for aviation in the Southwest.

Among those who will speak at the airport conference this week will be I. C. Street, CAA regional manager and originator of the conference, and I. B. Boush, CAA administrator. Dr. John Frederick, professor of transportation, University of Texas; Stratton Acker, director of aviation, Oklahoma City, and a group of top experts of the Civil Aeronautics Administration.

W. G. K.



He covers the continent - between editions

In 6 hours and 58 minutes, less than the time between morning and afternoon editions, the TWA Lockheed Constellation air transport, by this flight, reached scheduled stops frequently possible only in military planes.

This TWA flight proved that such air travel will become routine, enabling passengers to cross from New York to Los Angeles between midnight and breakfast, with a full business day at each end. Planes like the Constellation

ensure true overnight service to frontier ports.

Fewer Wright Cyclone 16's of 2,200 horsepower each power the Constellation. Most powerful engines in service, Cyclone 16's mean the choice of engineers and operators alike for reliability, fuel economy and the payload bonus on every flight which their lesser unit weight provides. Such basic factors, plus the Cyclone's low maintenance cost, continue to demonstrate the axiom that Wright Cyclones pay their way.



Cyclones Save 3 Ways

LESS WEIGHT—MORE PASSENGERS
LOWER FUEL CONSUMPTION
REDUCE MAINTENANCE

WRIGHT
Aircraft Engines

"Weight Saved On a TWA Plane Worth \$173⁰⁰ a Pound in 1943"



SAYS J. C. FRANKLIN
Vice Pres. of Engineering
Transcontinental & Western Air, Inc.

"SINCE September 9, 1943, the standard operating weight of TWA DC-3 aircraft, consisting of airplane, crew, oil, full equipment and meals, has been decreased 261 pounds per aircraft for summer operation and 279 pounds per aircraft for winter operation.

"Interpreted in terms of payload space, which TWA valued at \$173 per pound in 1943, we have found that this weight reduction program has given us the equivalent of an additional DC-3 for our entire fleet of Skycocks."

SEND FOR FREE BOOTS WEIGHT-SAVING BOOKLET TODAY

Comparative weights of various types of self-locking nuts comprehensively reviewed for the convenience of aircraft designers, engineers, operating and maintenance personnel. Copy will be sent you, free, on request.

BOOTS

They Fly With Their Nuts On—Light!

Boots Aircraft Nut Corporation, General Office, New CANAN, Conn., Dept. L

BOOTS NUTS SAVE UP TO 60 LBS. PER PLANE

- Much lighter yet far tougher than other nuts.
- Standard fastenings on all types of military fighters, bombers, cargo carriers.
- In process will be standard on commercial planes.
- Can be used over and over again.
- "Outlast the plane."
- Approved by all government aviation agencies.



This is new type of the famous Boots self-locking Nut—can be straight or curved without any fast assembly.

THE AIR WAR

COMMENTARY

Improved Warplanes Extend Navy's Penetration Into Enemy Territory

Emergency conversion of bombers into transports for speedy shipment of vital cargo provides preview of what's likely in post-war developments.

Recent statements of Admiral Towers and Admiral Nimitz concerning powerful Naval air blows soon to be struck far deeper into enemy territory are backed up by an accelerated program to incorporate vital improvements in all existing types of naval aircraft and to speed up development and production of brand new models. Naturally details are not releasable, as it is the Navy's intention to let the Japs find out about them the hard way, but close observers have found indications of some of the important trends.

► **Increased Striking Power**—In line with the Army Air Force development of the B-24 Mitchell medium bomber, Navy's PB1-1 is also being delivered with greatly enhanced firepower, improved gun-sights, bomb-sights, radio and navigation equipment.

In the same way the Navy version of the RAF Ventura and AAF B-24, designated PV-1, has been radically improved, with increased firepower, longer range, improved engine and additional armor protection. These fast, powerful medium bombers are striking deeper and deeper into the Kurile Islands,

which are north of Japan. The program to replace the hard-working Dauntless dive bombers with Hellcats has been stepped up, and Curtiss job is being constantly improved, a sleeker, faster version being powered by a new model of the Wright R-3600 engine (four-bladed propeller and equipped with a power-turbine). It has already been described as Navy's "Sunday Punch" in the South Pacific. The hefty Grumman Avenger torpedo bomber in its two years of active service Midway has demonstrated excellent flying and fighting characteristics. This ship too is being further improved.

► **Faster, More Powerful Fighters**—Not only a wider Wildcat (FM-2, General Motors), most powerful light carrier-based fighter in the world, but greatly improved Corsairs and Hellcats are now going into service.

Water injection, improved superchargers, heavier fire-power (including 33 mm cannons and rockets, the latter also on some of the bombers), improved cabins, larger drop tanks, increased internal tankage—all this adds up to

harder blows nearer the heart of Japan.

Rocks for bombs up to 1000-pounds enable these fast, powerful fighters to double-up on occasion as dive bombers or fighter-bombers.

Special equipment will enable some of the new models to operate as night fighters. According to reports, a large eagle twin-engine fighter is under development and may be in action before the end of this year.

It is expected that this fighter and new versions of the Corsair (FM1) and Hellcat (FM2) fighters and Ventura search-bomber (probably PV-2) will be powered by the new P & W Double Wasp R-2800-C engine as soon as these are available in quantity from the plants of Pratt & Whitney Kalamazoo City, Chevrolet and Nash; the "C" engine will raise the present horsepower of the Double Wasp by more than 33 per cent.

► **Bombers Carry Vital Cargo**—The urgent need of speedy transportation of critical parts, supplies and other items of high priority cargo saw two large Consolidated aircraft transformed into cargo-passenger transports within a few months of Pearl Harbor.

These were the Navy Coronado (PB3Y3) and the AAF Liberator (B-24). Nobody claims that they are as efficient as specially designed ships would be, but the modifications saved huge sums of money and, more important still, that precious element—time.

The Martin Mariner (PB4M) was suitably modified and now, after several record-breaking tests, the huge Marra has been accepted as a fast, long-range high-priority cargo transport, with 33 more ordered for delivery during 1944-45.

The British have carried out a similar program with some of their land-based bombers, including the Warwick from the Victoria Well-



"Coronado" Bomber Becomes Transport: Typical of changes made by the Navy in its aircraft for the Pa-

cific offensive is conversion of most of its Consolidated Coronado bombers to transports.

region, and the York from the Avro Lancaster, which like the Constellation has a triple-aisle.

► **Post-War Transport**—But for the war, the Lockheed Constellation (originally to be named *Knackbur*) would have long before this been making fast transcontinental trips and flights to South America according to the original plans of TWA-Pan-American and Lockheed.

The AAF have accepted the fast two to the C-54, and now that the twin-engine Lightning is coming into high production, with widespread and also intensive local subcontracting, contracts have been given for a limited number of C-54s for delivery during the next couple of years.

A highly promising post-war transport in the Consolidated-Vultee 44-passenger Model 38, with the Liberator wing, engine and landing gear arrangements, but single-aisle. Despite these borrowings from the Liberator (C-57) which was essentially a stop-gap wartime model, the 38 is a beautifully designed job, with luxurious passenger accommodations.

If the Atlantic-Pacific war should extend longer than the present consensus of best military and naval opinion (say spring of 1946), it is not unlikely that Model 38 itself may turn up in a wartime version.

► **Bigger Giants on the Way**—Douglas, too, has hopped onto the post-war transport band wagon with the announcement of its huge DC-7, which promises to transport 86 passengers at something like 405 mph top speed, cruising at about 325, powered by four very large radial engines estimated at 3000 hp each.

A group of writers were recently given a glimpse of a mock-up of Convair's Model 31, a still larger aircraft to be powered by six of these engines with turbopropellers, at Consolidated-Vultee's Ft. Worth plant. This is the so-called 400-passenger plane, to which refinements have been made in the past, although tender comports the comment that from one-third to one-half of this number is more likely as a practical proposition.

Being at the moment aware far too busy getting the colossal B-28 production program rolling at Wichita, Seattle and Brevin to worry about post-war transports, but a transport version of the Superfortress itself is far from an impossibility.



Cluster Bombs: Twenty-pound fragmentation bombs, empty for testing purposes, are shown above in cluster arrangement at Materiel Command headquarters, Wright Field, Dayton.

► **Night Fighters on Offensive**—As a general rule, the emphasis in night fighting is on the interception of enemy bombers—a defensive operation. However, for more than two years the Royal Air Force has employed a form of offensive night fighting known as *Intruder Twines*. In the early days heavily armed night-fighter Hurricanes and Beaufighters often teamed up to cause as much damage as possible to the *Luftwaffe*, snatching after the battle of Britain.

In a typical example Beaufighters would meet the German bombers (JU-88s or He-111s) over the English Channel and down as many as possible on the way to the target and back to mid-channel. Before turning back they would note the number, altitude, direction and speed of the Nazi bombers to a group of Hurricanes waiting on the French coast, which took off and proceeded to join the bomber formation, bleeding into the rear where their nose would be unprotected.

Coming into the German airfield, where the bombers finished their heading lights, the Hurricanes would blast away, usually destroying some and causing great confusion.

Later, Douglas Harrier took up this chore, and more recently the

night-fighter version of the Mustang II. By this means the *Luftwaffe* bases have been steadily pushed farther from the French coast.

Similar tactics have been employed in the Mediterranean and other theaters, and American pilots have reported that the Lockheed Lightning is an excellent airplane for this type of work.

—NATHAN

Cluster Bombs Play Major Role in War

Used effectively in bombing phases on ground or attacking troop concentrations.

Less publicized than the giant blockbusters, but playing an important role in bombing attacks, particularly on enemy air bases and troop concentrations, are the cluster or fragmentation bombs which are being dropped in large quantities by U. S. bombers.

Designed and developed by the Materiel Command Armament Laboratory at Wright Field, the cluster bomb, as the name implies, is a group of small bombs strapped together to form a single bomb which can be carried on any service bomber. When the cluster is released, the straps are automatically loose the metal straps and the cluster breaks apart in the slip stream. The individual bombs stabilize in a dispersed pattern and are down to their target.

► **Range**—When they hit, shrapnel covers an area 200 feet wide on both sides of the line of flight. The scattering of shrapnel is particularly effective in destroying parked planes or when dropped in troop concentrations.

► **Chain Device Tried**—At first a suggested bomb-chain arrangement was tried but this was unsatisfactory for two reasons. Small bombs separated individually in chains and released in large numbers simultaneously would collide when the airstream hit them, which was quite unwholesome for the crew of the bomber. Secondly, the method required special bomb chains for any plane using the small bombs.

The cluster idea was then tried, with credit for the development being given largely to Willard M. Naff, supervisor in the Armament Laboratory's bomb tests and.

► **Incidencies Also Used**—Beside using fragmentation bombs, the cluster arrangement is also adaptable to use with incendiary bombs

Phillips

one of the nation's
five
largest producers
of 100-octane
aviation gasoline

Phillips AVIATION GASOLINE

PERSONNEL

W. L. (Law) Whelan has been appointed engineering manager of Douglas Aircraft Co., Inc., Tulsa plant, in addition to his duties in the manufacturing division.



In 1945, at the request of the Navy, he accompanied two representatives of Douglas B-24 bombers to the Hawaiian area aboard the aircraft carrier Lexington and later assisted as a contractor's engineering representative on a revised B-24 model at the Norfolk air station.

Carl Lawrence J. Chappin, veteran Transcontinental & Western Air pilot, left to the AAF Materiel Command to run service tests on the new Constellation C-54 transport, died at Dayton recently of heart attack. A pilot for TWA since 1935, he had flown more than two and a quarter million miles, including 250,000 miles of overwater flying with the TWA intercontinental division for Air Transport Command. Captain Chappin headed a TWA crew



SIMMONDS ARRIVES IN U.S. Sir Oliver E. Simmonds, M.P., chairman of Simmonds Aerocorpus Ltd., was met after his Atlantic flight aboard an American Export airliner by Mr. and Mrs. William R. Bryant, Bryant is president of Simmonds Aerocorpus, Inc., of this country. Sir Oliver is en route to Australia to confer with aircraft industry leaders. He is a member of the British Joint Air Transport Committee—an organization concerned with post-war inter-national air development.

which spent months at Burbank, Calif., familiarizing themselves with the Constellation through test flights.

E. N. Lawrence, works manager of the Miami division of Consolidated Value Aircraft Corp., has resigned.

Carl F. Baker (photo) has been appointed chief engineer of Hamilton Standard Propellers Division of United Aircraft Corp. He has been serving as assistant chief engineer since 1939 and manages a post that has been vacant since the promotion of



Edie Munk to engineering manager in 1945. He is a pilot and has more than 900 hours in the air on his log. He flew with the U. S. Army until 1932.

Howard C. Stohr has been appointed managing director of Goodyear Tire and Rubber Co. Ltd., of Australia. He succeeds W. C. Edgar, resigned due to ill health, who will remain a member of the board of directors and continue as vice chairman. The Australian division of Goodyear Export Co. manufactures airplane tires and is now producing a complete line of bullet proof fuel tanks for the American and Australian air forces.

B. C. Anderson has been appointed assistant general sales manager of the Nash Motors Division of Nash-Kelvinator Corp., succeeding Geoffrey Keckler, now corporation treasurer.

Frank E. Dase is now superintendent of tool crib for Consolidated Value's Fort Worth Division.

Reg Geo Lewis G. Morris, now attached to the Fourth Marine Base Detachment Air Wing overseas, has been ordered transferred to Cherry Point, N. C., as commanding general of the Sixth Marine Air Wing. Reg Geo Lewis G. Morris has been transferred from his present duties overseas to the Third Marine Air Wing. General Morris, former assistant naval attaché for air at the American Embassy, London, was second-in-command of an air unit which fought the Solomon and New Georgia Islands.

Richard N. Correll has been named regional assistant to Vice President, public relations director of Curtiss-Wright Corp. Correll, who has resigned as Washington correspondent



Richard N. Correll

for the St. Louis Globe-Democrat has been assigned to Curtiss-Wright's Washington office. He has been with the Washington Star, Associated Press, Dallas News, Denver Post and other news and trade publications. Correll also served as assistant to the public relations director of the Southwestern Bell Telephone Co. at St. Louis.

James P. Jeffrey (photo) has been appointed personnel manager of Hamilton Standard Propellers Division of United Aircraft Corp. He replaces W. T. Rada, who is leaving the division to become personnel manager of Pratt and Whitney Aircraft Corp. of Missouri. Jeffrey has been serving as assistant to the personnel director of United for several months.



J. Nelson Kelly is now executive vice president of Pire Lock-Mat Corp., a subsidiary of the Becht Aircraft Corporation. Kelly was his wings in the last war and flew the air mail in its early days. He was an aviator's assistant for the Commerce Department, a test pilot and sales manager for the Aviation Corp., and became the first manager of Elgin Bennett and the New York Municipal Airport and was operations manager of Roosevelt Field.



Willis H. Edmund, employee activities director of Goodyear Aircraft Co., has been named to direct employee educational and recreational activities of all Goodyear plants.

Samuel G. Saxe, test engineer in charge of the chemical and metallurgical



Destined to be a Leader in Fine Aviation Oils ... D-X Aviation Oil has been pre-tested for the age of flight ahead for all of America. Proved in the crucible of war ... this high quality, super lubricant has been developed by Mid-Continent, one of the world's largest refiners of superior lubricating oils.

Made to meet the right specifications of the aviation engineers of the U. S. Army and Navy.

MID-CONTINENT PETROLEUM CORPORATION

TULSA, OKLAHOMA

action of Development Engineering at Willow Field, has been elected chairman of the Aircraft War Production Council (Federal Fuel Tank Setting Project Group).

Helen Wilmsen has been appointed purchasing manager of Jordanoff Aviation Corp.

Thomas A. Perrett (photo), formerly district traffic manager for National Airlines, Inc., with headquarters in New Orleans, has been promoted to Eastern regional traffic manager with headquarters in New York. John Hughes, formerly New Orleans city traffic manager, replaces him as district traffic manager. National has opened a New York City ticket office in the Airlines Terminal Building.

Red Bogert is project engineer on the new Navy bomber-torpedo plane, BT-9, being built at the Ki Segoado Division of Douglas Aircraft Co. The Truman Commission recently revealed that Douglas is building this plane before becoming a project engineer for the BT-9. Bogert was

assistant to the chief designer at Douglas, which he joined in 1944.

Douglas Aircraft Co., Inc., announces that D. E. Dowling (left),



Dowling

Sperleder

formerly engineering manager at the Tulsa plant, has returned to the home plant at Santa Monica to become executive engineer. E. H. Sperleder, has been appointed administrative engineer at the Santa Monica plant. Sperleder specialized in mechanical engineering and joined Douglas 14 years ago. Before he became executive engineer, he was CAA liaison.

Joan Anderson is in charge of sales promotion for the Plastics Engineering Division of the Dow Chemical Co.

J. E. Granley has been promoted to superintendent of field operations at Consolidated Vultee's Fort Worth division and Fred F. Gagliardi has been appointed general employment supervisor. E. L. Wilmsen becomes superintendent of major assembly departments at the Fort Worth division.

Gagliardi succeeds Les E. Wheeler, resigned.

Capt. Messias M. Budley, USN, has reported for duty in the Lighter-than-Air Section of the Office of the Deputy Chief of Naval Operations for AV.

Paul Wark, chief engineer in charge of aircraft airframes at Bendix Aviation, has been elected secretary of the Chicago section of the Society of Automotive Engineers.

Two recent changes in Marine aviation assignments include transfer of Col. David P. O'Neill to Marine headquarters and Lt. Col. Elton H. Sord from the San Diego area to the Navy Department.

R. J. Robinson, Canadian traffic manager of American Airlines, has been appointed chairman of the aviation branch of the Toronto Board of Trade.

TELLING THE WORLD

Mid-Continent Airlines, Kansas City, Mo., has placed its advertising account with Oglethorpe & French and Associates, St. Louis, effective July 1. Newspapers, trade papers, and direct mail are to be used.

H. K. Sawerton has been promoted to the staff of the industrial relations director of Consolidated Vultee Aircraft Corp.'s San Diego Division. He replaces L. H. Smith, who is now assistant to the corporation industrial relations director in Washington, D. C.

Simmonds Aerocontrols, Inc., has issued a new illustrated brochure entitled "Simmonds Products Fly with Famous Flyers." It describes Simmonds aircraft product.

Worthen Advertising Associates plan to use newspaper and magazines for the Melville Aerocontrol Radio School account.

Sperry Corp. is broadcasting direct from battle fronts to war production fronts on Bandages. Paul Manning tells Sperry employees how equipment they build is being used at the front as part of his broadcast under Sperry sponsorship.

Don M. Tressman is new director of public relations with O'Brien Goussard, Ltd., Vancouver agency, after serving as public relations supervisor of Boeing Aircraft of Canada, Ltd.

R. J. Lang, formerly head of the Cleveland agency, Lang, Fisher and Stettin, Inc., and now with the Purging division, Air Transport Cleveland, Kentucky, is executive for personnel, has been promoted from captain to major.

K. J. Fong has resigned as assistant general sales manager in charge of advertising for the Dodge Division, Chrysler Corp.

Albert Winstley Co. has taken over the account of Calkins Aerocontrols, New York City.

Vega
NORCE

Simmonds Push-Pull Controls
-The Industry's Choice-

Fairchild Aircraft

SOME OF THE MANY USES:

Propeller Pitch and Governor • Thrust • Carburetor Air and Filter • Supercharger • Remote Valve Control • Mixture • De-Icer • Cargo Door

YEARS of leadership in the field, an outstanding record of performance, continued modernization of design... these are the reasons why Simmonds-Corby Push-Pull Controls are the choice of leading aircraft manufacturers. With more than a decade of operating experience, these precision-built controls were the first to gain the "Yellow Dot" of acceptance in the U. S. Army Air Force Weatherization Program, attesting to high performance under Arctic conditions.

More than 500,000 Simmonds controls have been installed on aircraft of the United Nations. A new design innovation in the Radius Unit (Illustrated) so provides rotary action from basic push-pull operation. Because of their rugged precision-built qualities, these controls are fast finding new applications in the aerospace and ordnance fields as well as in aviation.

Strategically located Simmonds branch offices make possible the utmost in customer service. Let us help you with your control problems. Your inquiries are invited. Write for free design literature.

SIMMONDS
REDESIGNING INC.

30 Rockefeller Plaza, New York 20, N. Y.

Branch Offices:
Detroit • Washington • Hollywood • Montreal
Manufacturing Plants: New York • Vernon • Coltonville

WINDMILL ENGINEER PULL WIRE
FIRST TIME IN MAJOR AIRCRAFT

Aeromatic, Taylor Controls
Push-Pull Controls
Hydraulic Actuators
Hydraulic Tests
Chromalox Insulators
Spark Plugs
Self-Kipping Red-Eye Beams
Bolsters and Clips of
Specialized Design



AVIATION PIONEERS MEET:

Charles A. "Chief" Kildner, left, shakes hands with William B. Birren, newly appointed sales and service manager of Wright Aerocontrols Corp. Birren was making his initial tour of the West Coast and was going through Aircraft Industries Co., exclusive distributors for Wright engines, of which Kildner is superintendent and chief engineer. Birren has spent over 27 years in field service and engineering work and Kildner joined Curtiss-Wright Corp. in 1930 as assistant service manager.

FINGER-TIP CONTROL

for MARTIN TURRETS

A G-E Engineered System That Facilitates Accurate Aiming at 300 Mph

■ Every fighter hunting "round" a bomber can make things tough for a turret gunner. But one thing now made easy for him is the control of his turret—a job that a G-E control system can do electrically.

In a Martin turret, the gunner does not have to move the guns themselves. He simply turns his control handle—the turret and guns move correspondingly. Smoothly, speedily, and without effort, the gunner is able to track and hold his gaze on the enemy plane.

Exactly what this highly successful system

comprises and how the various elements are connected cannot be told. But typical components are described at the right.

Designing and producing aircraft systems for flight, radio, and power plant control is becoming an increasingly important phase of General Electric's engineering. For information regarding available systems, and consultation regarding new projects involving electric control, write to the nearest G-E office: General Electric Co., Schenectady, N. Y.

Testing G-E control system for Martin turret under firing conditions



The G-E Turret Speed-control System

This typical G-E aircraft system facilitates control of the turret and its gun. While its layout and equipment specifications cannot be revealed, components include the following:

1. **TURRET DRIVE MOTOR** Standard G-E 24-volt d-c intermediate-duty unit of rigid construction and light weight. Equipped with steel shaft, aluminum or magnesium and shields, and double-shielded ball bearings.

2. **AIRCRAFT AMPLEDYNE** Provides accurately amplified power (up to 10,000 to 1) from low control field excitation, and instant response, insuring smooth, dependable performance under rapidly changing conditions.

3. **REVERSE-CURRENT RELAY** Automatically connects or disconnects generator from bus. Opens main contactor on reverse current of about 15 amp. Will interrupt reverse current several times rating of relay.

4. **VOLTAGE REGULATOR** Controls generator field current and maintains constant voltage under varying generator speed and load. Equipped with equalizing coil for equal division of generator load in multi-segment aircraft.

5. **AIRCRAFT D-C GENERATOR** Supplies electric power for G-E "power packages" and other electric equipment, as well as for turret. Especially light in weight, with high overload capacity. Special shaft construction withstands vibration and torque pulsations.



**PRECISION PRODUCTS
AND ENGINEERED SYSTEMS
FOR AIRCRAFT**

GENERAL ELECTRIC



Britain Releases First Summary Of Wartime Plane Production

Output for 12 months ended March 31 totals 27,000 aircraft compared with 95,782 turned out by U. S., according to official London data.

Great Britain's annual aircraft production, disclosed last week for the first time, is slightly over one-fourth that of the United States, comparison of available data reveals.

In the 12 months through March, British factories turned out 27,000 planes. In the same 12 months, the United States had produced 95,782 planes. In both instances, the airframe rate had increased the British to nearly 300,000,000 pounds for the year, the American to 84,000,000 pounds for December alone, and 145,000,000 for the year 1943. This year, the American figure is more than 300,000 pounds a month.

► **Trailers**—The increase in opera-

tional types also was relative, with only six percent of the British production by weight in trainers. American production of trainers this year runs about 9 percent.

The British also revealed that their production in 1938 was less than 3,000, under 3,000 in 1939, 8,000 in 1940 and 15,000 in 1941. The British earlier had disclosed that the total wartime production from British factories had been 30,000 planes of all types. American production in a comparable period had been about 175,000 planes.

However, British airframe weight through March this year was 50 times greater than that of 1938, seven times the weight of 1939 and

not far short of four times the weight of 1940, in which concentration of British factories was on fighters.

► **Efficiency Stopped Up**—Improvement in types also is noted in the British production. Bomb-carrying capacity, for example, per pound of airframe weight of current bomber production, is nearly double that per pound of production in 1940.

The percentage of British women employed in aircraft plants is almost exactly the same in ratio as the United States—60 percent—despite the emphasis placed on the employment of British women for war jobs. At the same time, the manpower employed by the British aircraft and accessories industries has increased 20 times, with the productivity of the individual employee increased between three and four times in comparison with 1938 figures. American employment rolls have increased 28 times.

► **Engines**—Aircraft engine output last year fell just short of 90,000, the British report reveals, with a horsepower equivalent of five and one-half that of the first 12 months of the war.

Spare production has been increased in ratio, and now stands at an equivalent of 50 to 60 aircraft for each 100 complete craft built. The British industry also has been responsible for major repairs to planes, working on 15,000 last year alone.

Monsanto Develops New Plane Plastic

A new high heat-resistant thermoplastic valuable in manufacture of aircraft instruments and radio equipment for planes, has been revealed by Monsanto Chemical Co.

Produced for some time on an experimental basis, the new thermoplastic—Ceres—is the first developed that can hold its shape and strength in boiling water and yet can be molded by the fastest, most economical methods, the company reports. The entire production now is going into war work.

► **Heat Distortion Point**—The heat distortion point of Ceres is above the boiling point of water—220 degrees F. This is higher than any other thermoplastic material with the exception of a highly-solvent high cost material used in super high frequency insulation, the company said.

Some of the material now is



1894-1944
Pioneers for 50 Years

For half a century, The Cleveland Pneumatic Tool Company has devoted itself to serving many major industries.* Skilled mechanics and experienced engineers within our organization have pioneered and perfected many products for each of these fields. This initiative and resourcefulness have enabled us to keep abreast of this country's remarkable industrial progress... We are commemorating our golden anniversary by continuing to put all our talents and energies in the fight to preserve the American way of life. We are proud to have grown with our nation for 50 years, and look forward to serving in the great future that lies ahead.

Buy U. S. War Bonds and Stamps

THE CLEVELAND PNEUMATIC TOOL COMPANY

AND SUBSIDIARIES
THE CLEVELAND ROCK DRILL DIVISION CLEVELAND PNEUMATIC ABROS, INC.
CLEVELAND PNEUMATIC TOOL COMPANY OF CANADA, LTD.

*CLECO Pneumatic Tool speed production in metal-working plants. AEROLS (the shock absorbing landing gear used in automobiles on airfields) insure safe, smooth landings and take-offs. CLEVELAND Rock Drills are widely used in the mining and contracting fields. CLE-AIR Shock Absorbers protect buses, trucks and trailers from road shocks.



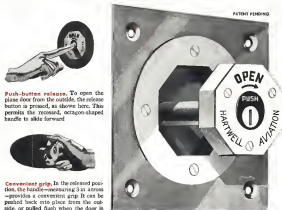
TEST CHAMBER FOR RADIO EQUIPMENT:

An 18-inch test chamber that will permit many experiments hitherto impossible has been built for a radio equipment plant for test use. Air at 75,000 feet altitude can be simulated and temperature can be brought down to 47 degrees below zero or up to 194 degrees F. The cylinder, eleven feet in diameter, was built by the Kold-Mold Manufacturing Co., Lansing, Mich., with features that make it possible to duplicate almost every weather condition.

NOW! A flush door lock for aircraft

Projecting door handles are eliminated by the new Hartwell flush door lock. It presents a smooth, flat surface; improves streamlining and adds performance. The lock comes equipped with mounting plate, variable skin-thickness adapter plate, and a key

lock, which is built into the push-button control. Designed for fast warplanes, the new Hartwell flush door lock will be a streamlining asset on all peace-time planes. Write our Los Angeles office for complete engineering details for this "airage" door lock.



Push-button release. To open the plane door from the outside, the release button is pushed, as shown here. This permits the recessed, octagon-shaped handle to slide forward.

Convenient grip. In the released position, the handle—measuring 3 in. across—provides a convenient grip. It can be pushed back into place from the outside, or pulled flush when the door is closed from the inside.



Profile of handle. This cutaway view of the Hartwell flush door lock shows how it looks installed. It can be adapted to doors of varying thickness by lengthening or by shortening the inner door handle shaft.

The Hartwell flush door lock is shown above in the open position. It is complete with mounting plate and the compact variable skin-thickness adapter plate, flush-mounted to the mounting plate. To install, the airplane builder has only to make a circle cut-out for the adapter plate.

Single source for 779 different aircraft production parts and tools

HARTWELL
AVIATION SUPPLY COMPANY

2417 Crenshaw Boulevard, Los Angeles 16, California
Dallas, Texas • Detroit, Michigan • Kansas City, Kansas

be used in aircraft battery cases, and an one test successfully without heating of the sulfate and electrolyte.

Surplus Inventories To Go Into Storage

Meals Reserve Corp. contracts for 50 warehouses for planes that are surplus instead of 100 as originally planned.

Fifty warehouses will handle excess inventories of aircraft plants turned over to Metals Reserve Corp., instead of the 100 or more originally scheduled to receive the material. Details of contracts are in the hands of warehouses, and are scheduled to be returned this week, after which the process of transferring the excess inventories will be started. Concentration of the handling to fewer warehouses is expected to make handling easier.

One company—Republic Aviation—will go through the complete surplus inventory transfer process first so that any "bugs" in the system can be worked out before the bulk of the materials starts flowing from the war plants to the warehouses handling steel, aluminum and other products for redistribution to other elements of the war economy. Some may go to civilian production where such production is authorized by the WPB.

Sequestration. Some plants already have completed the sequestration of excess inventories and have made their reports. Qualified sources say that quantities are not excessive because of the relative volume of production handled by the reporting plants. Eighty percent of the reports are expected to be made by the end of this week and probably 90 percent will be complete by the end of the month. Two companies affected by recent contract cancellations will have to revise their reports and undoubtedly add a considerable volume to the total now held by the aircraft plants of the country.

Squares. Brewster Aeronautical's situation cannot be determined for some time until there is a decision on use of parts fabricated for Brewster in planes built by Chance Vought and Goodyear. If they cannot be used, the total will increase sharply, eased only by the quantity to be taken by the Navy as spares for existing Brewster Corsairs. Even this probably will not

be great, since spaces have been delivered with regular production. Cancellation of the Douglas A-20 contract will similarly affect the Douglas plant.

Some volume of excess inventories may start moving late this month, but the latest flow is expected in the late autumn.

No tabulation of value is possible yet, but there are some indications that it may exceed the estimate of \$160,000,000 for the country.

Rheem Buys Interest In Platt-LePage

Rheem Manufacturing Co. has bought a large stock interest in Platt-LePage Aircraft Co., of Edgemoor, Pa.

Purchase of the stock makes available to Rheem patents and designs for the Platt-LePage helicopters, making it possible for both companies to produce helicopters—during the war for military purposes and later for commercial and possibly private production. In addition, Rheem will take an active part in Platt-LePage development under an agreement with other large stockholders.

Diversification. Rheem has specialized largely in drums, tanks, barrels and pots, but has done other shell-metal and machine work for the government during the war. It operates nine plants from Maryland to California and has a half interest in an Australian plant. Three last year it had stayed pretty much within its primary

field, but in September brought out an olive-drab-colored, corrosion-resistant covering for steel or cast-iron surfaces, called Inchrone, and the latest purchase is interpreted as a further step in diversifying its products.

Ford Speeds Output

Seventy percent increase in production of the Pratt & Whitney 2,000 hp engine and a 25 percent increase in output of GE turbosuperchargers in the past six months are reported by Ford Motor Co.

Production schedules have been met or exceeded in all lines of the Ford aircraft program, the company says, with the Liberator program at Willow Run remaining ahead of commitments, as it has since last September. The company also is making Waco CG-4A combat gliders at the Iron Mountain plant, and aircraft generators.

New Plane Insulation

A new type of glass fiber insulation is being used in many American war planes, weighing only 6/100 pound per square foot.

The fibers are formed into half-inch thick sheets with a thermosetting resin binder. They gain less than one percent of their own weight from moisture in the air when subjected to temperatures of 135 degrees and 90 percent relative humidity, according to its developer, Owens-Corning Fiberglas Corp.



MOSQUITO ASSEMBLY LINE:

Wing assemblies in the foreground and nearly completed ships in the background are shown in this view of a British factory making the speedy, versatile Mosquito, which is being used for a wide variety of purposes made possible by its extremely high speed and maneuverability.

Test AAF Equipment In "Largest Icebox"

Huge Wright Field cold chamber is big enough to house fuselage of Flying Fortress.

By ALEXANDER MCURELY

"Largest icebox in the world" is the claim made for the newest and biggest cold test chamber at the AAF Material Command laboratories at Wright Field, Dayton, Ohio, the 50,000 cubic foot capacity refrigerator of the equipment laboratory.

Housed in its own building, the cold chamber can accommodate the fuselage of a B-17 Flying Fortress, or a full sized fueling truck and trailer. Internal dimensions are 25 by 25 by 50 feet.

55 Below Zero—Although a standard test temperature of 70 degrees below zero at sea level pressure is used for cold testing Air Force equipment, the chamber can drop to 55 below zero.

A wide variety of equipment already has been tested in the chamber, including both equipment carried in a plane at the sub-zero temperatures of high altitude, and ground equipment used in Arctic temperatures. Some of the tests go on for days, weeks or even months, until E. J. Nutter, engineer in charge of the test

chamber, and his staff are convinced that the equipment is suitable for cold temperature uses.

New Devices Added—While certain tests have been in operation for the last four months, additional control panels and devices for measuring various reactions are still being installed. Prototype items tested thus far include secondary powerplants, clothing, heaters and similar articles.

Some tests require continual presence of engineering personnel in the cold chamber for as long as three hours. Electrically heated and fuel-lined flying suits are worn, but face protection was a difficult problem, which even the use of regulation high altitude face masks, worn by air gunners, did not solve.

Felt Masks Used—Finally with the help of Material Command clothing experts, felt masks were designed which have proved more satisfactory. The felt is thick enough to keep body heat inside the mask, condensing about the face, while moisture does not condense readily on felt, so that there is less danger of moisture freezing on the masks.

Five engines provide power for the refrigeration units. Observation windows in the chamber, enabling engineers to watch tests from the more comfortable temperatures outside, have eight

panes of glass, to prevent frosting, and to seal the cold air within the chamber.

Helium Plants Meet Huge War Needs

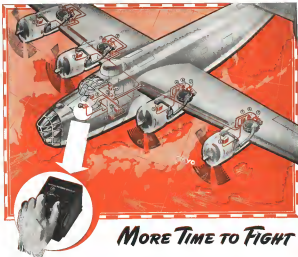
New units testing out ten times pre-war output at price of two cents a cubic foot.

Helium for war uses is being produced for less than two cents a cubic foot at a rate ten times greater than the amount turned out by a single plant before the war. The price of less than two cents compares with \$2,500 25 years ago.

Interior Department officials have revealed that five plants now are producing helium for anti-submarine blimps, barrage balloons, meteorological balloons and other war uses, and that production for the last six months of 1943 and the first two months of 1944 greatly exceeded production for the entire preceding 12 months.

New Plants Meet Demand—New plants now are producing all the helium needed for war and civilian needs, according to testimony before a House appropriations subcommittee.

The Amarillo, Tex., plant has been doubled in capacity and is producing five times as original volume. A new plant at Kael, Tex., provided as much in seven



MORE TIME TO FIGHT

The Electronic Control System for turbo-superchargers is another Honeywell contribution to safer and more efficient bomber operation. Engineered from the ground up by Honeywell, this system provides completely automatic control of manifold pressures and accurately governed turbo speeds. All four engines are controlled by the setting of one knob.

It gives Fortress and Liberator pilots more time to fight—more time to handle their ships—without worrying about manifold pressures and turbo speeds.

When victory is won, the same engineering ability that has contributed so much to wartime flying, will be ready to help with peacetime aeronautical problems. . . . Minneapolis-Honeywell Regulator Company, 2947 Fourth Avenue South, Minneapolis 8, Minnesota.

THE ELECTRONIC TURBO SUPERCHARGER CONTROL SYSTEM

1. Manifold Pressure Selector
2. Main Turbo Control Junction Box
3. Turbo Control Amplifier
4. Speed Amplifier
5. Nozzle Turbo Control Junction Box
6. Injection System Pressure Control
7. Turbo Supercharger Governor
8. Turbo Waste Gate Motor



World's Biggest Cold Chamber in Operation: Left, two equipment laboratory technicians, in the AAF Material Command's huge new cold chamber at Wright Field, wear felt face masks to protect eyes, nose and lungs from freezing in the 75-below zero



temperatures at which they work. They are shown at the electric control switch which opens the doors of the cold chamber. Right, electrically operated 25-foot tall doors swing open to allow a truck and trailer. The giant refrigerator has a 50,000 cubic foot capacity

ELECTRONIC CONTROL SYSTEMS
for the AERONAUTICAL INDUSTRY

MINNEAPOLIS
Honeywell
CONTROL SYSTEMS

months as the Fort Worth plant did in its eight years of operation. A second new plant at Ottumwa, Kan., went into operation last fall, followed by two others at Cunningham, Kan., and Shiprock, N. Mex., early this year. The New Mexico plant is in the Rutledge Field, where the helium yield of gas is higher than that of any field yet discovered. The four new plants were built at a cost of \$16,499,000, testimony revealed.

Other aviation items revealed by the hearings are:

► Aerial map making for the Army and the Navy is being done by a highly-trained group in the Geological Survey section.

► Small plants will be built soon to determine whether processes for the hydrogenation of oil from coal and shale can be done on a commercial scale.

► Despite warnings that the country has only a 14 or 15 year supply of oil at present rates of consumption, it cannot be drawn from the earth in that period and will not be used up for at least 50 years.

► But after the war, the United States will have to stop exporting oil and may reach the point of being an importing nation.

► We are now creating oil oil reserves at the rate of one and



LINK'S REGIONAL ENGINEERS:

New chief regional engineers of Link Aviation Devices are, left to right: W. Henry Sutton, middle and southwest; J. Richard Lendler, southeastern area; Edmund L. Becker, northeast region including New England, North Atlantic and portions of the upper south; and Herbert A. Williams, West Coast.

one-half billion barrels a year.

► Present methods of producing manganese place a penalty on the use of domestic ores, but the electrolytic process of the Bureau is successfully showing they can be used. Education of industry with large investments in other processes and foreign ones is slow, how-

ever, Congressmen were told.

► Aluminum production has been ordered cut 40 percent.

► But development of bauxite deposits in this country are continuing, because of the danger of foreign sources being cut off at some future time.

Ambulance Planes

Northern DC-64 Morane single engine transports are being used by the HCAF to ferry wounded soldiers from front-line areas, the Canadian Medical Association was told at a recent meeting in Toronto, at which the HCAF exhibited latest research developments of its medical division.

Canadian Output

Canadian production of Curtiss Hellfire for the United States at the Fort William, Ont., factory at Canadian Car & Foundry Ltd., is more than two a day. All planes are delivered ready for combat. The factory is using a novel robot paint machine in its Hellfire production that paints the parts, wires and drive part in one operation.

Willis Output

Willis-Overland is turning out more than a million pounds of aluminum forgings each month for use in plane manufacture. The company is one of the three largest producers of small bomber forgings in the country. More than 700 types are turned out.

W. A. PATTERSON, President of United Air Lines



"...YOU SAY VIBRATOR POWER SUPPLIES CAN INCREASE SAFETY AND COMFORT IN PLANES?"

MR. W. A. PATTERSON, President of United Air Lines, recently said—

"It is my belief that the war has advanced public acceptance of the airplane as a mode of transportation by a great deal. The airline like every other service that caters to the public, must anticipate their passengers' expectations of new facilities for greater comfort and safety. United will put in several new, large jet passenger airplanes offering comfort, convenience and thoughtful appointments including beautiful interiors and flying from coast to coast in as little as one day to meet safe flight."

U. S. is easily right now with Vibrator Power Supplies in being prepared for the greater comfort of fluorescent lighting as well as the convenience and safety of radio and intercom systems. U. S. Black Light equipment is available as a safety device for instrument panel illumination is light to eliminate blinding glare and to provide clear, sharply defined instrument readings. Engineered to specific noise and voltage requirements, Electronic Laboratories products are used wherever our customers be changed in voltage, frequency or type. U. S. engineers were required

THE X-244 LIGHT

Black Light Illumination is standard equipment on new military planes. The X-244 Light provides both glow (black) or no-glow light and white light. Low Current Black offers our selection of desired economy and type of light. Operates on 70 volts and weighs 12 pounds. It includes built-in remote controls. Quick changeable from glow to no-glow, easy to install.



Light fixture as shown

Electronic

LABORATORIES, INC.

INDIANAPOLIS

ILLUMINATED POWER SUPPLIES FOR LIGHTING, COMMUNICATIONS AND ELECTRIC MOTOR OPERATING • ELECTRIC MECHANICAL AND OTHER EQUIPMENT



KNUDSEN STUDIOS NASHVILLE PLANT LAYOUT:

A three dimensional layout of the proposed steel assembly line at Consolidated Value's Nashville plant is shown under inspection by Louis G. Williams & Knudsen. The plant is shifting from Vengeance drive bombers to Lockheed P-38E. William Knudsen, chief industrial engineer, is at left; Walter Ford, who carried the scale models, is at right.

TRANSPORT

[illegible]

California Fire is engaged solely in the production of real results and assumes equipment for the January 2007 Fire Forum and Rough C-47 (airports). Except for special equipment training given in conjunction with its manufacturing operations, no cases are being taught. No enrollments are being accepted. No registration fees are being accepted. However, California Fire and its assets are looking to the future, and are looking for the best of all of its equipment and with all its current, progress, new ones, among things are to come. The incoming young people to take on current as the opportunities which a union will not cause to offer when the war is over, its actual is going away as an interesting, independent booklet. Its only purpose is to help you to transfer the future and to plan your career. Keep in mind, however, that the future is a growing year, indicating, variously revised. All you have to do is be interested in it. The book is open.



ILLUSTRATION—FACTUAL—COMPLETE

Describe different scenes, printing or drawing, producing materials, inventing different instruments and colors from flying, and other places of creation, naming. Describe animals of various, vast sizes, appearing. There is no rest or obligation. **JUST SEND A BERRY POSTCARD**

California Flyers, Inc.
SCHOOL OF AERONAUTICS

LOS ANGELES AIRPORT • LOS ANGELES, CALIFORNIA

Callaway Fibers, Inc., Dept. 444
Los Angeles Airport, Los Angeles, California
Circle 40. Please send me your free book.

Name _____
Address _____
City _____ State _____

Airlines Seek Price Formula For Return of Planes from Army

Representatives of seven companies and ATA find problem too complicated to solve at special meeting in Chicago.

BY MERLIN MICKEL

A group of airline representatives held a special meeting in Chicago recently to tackle one of the toughest angles in the returned plane situation—the question of

Officials of seven lines and the Air Transport Association faced the problem so complicated that they could reach no conclusion. ATA is continuing to work on it, with prospects that the next discussion will be with contracting officers in the Army. The Chicago meeting was attended by spokesmen for American Airlines, Braniff Airways, Chicago and Southern Air Lines, Mid-Continent Airlines, Pennsylvania - Central Airlines, Transcontinental & Western Air, and United Air Lines.

Formula Sought—The price question applies when planes bought by the Army from the airlines are made available for repurchase, as some have been lately. And it involves establishment of a formula under which the return price of each plane, variable according to individual characteristics, may be worked out.

Because of the lack of such a plan, lines to which the planes are being resold probably will not know for some time what their net purchase cost will be. Recoveries and overhead together will be the primary consideration in the new formula. Next in importance will be depreciation and the bonus paid the airlines by the Army for the planes when they were taken.

Bonus Problem—Is the bonus recoverable, now that the ships are coming back, and if so, on what basis? The airlines point out that they paid federal taxes on the bonus. Ideas vary as to the specific reason it was paid.

One theory is that the extra 32 percent was added to the price the Army paid for the planes against the time when the airlines might have to buy new ships. Another is

that it was intended to establish a fair consideration because, in light of the potential traffic market, planes were increasing in value at the time they were taken. A third opinion is that the bonus was intended to offset to some extent expected increases in overhead for sustained operations.

Depreciation Factor—The depreciation factor also is a hard nut to crack. Under the Civil Aeronautics Board formula used as a basis for the Army takeover prices, to which the 25 percent bonus then was added, a DC-3 is considered a 5-year airplane. Assuming for the sake of easy calculation that a DC-3 cost \$100,000 new, the residual value at the end of that service

would be \$20,000. Subtracted from original cost, this would leave \$80,000 as the depreciable value over the 5-year period.

In 1927, with light engines and early type equipment, basic planes cost about \$100,000. About three years later, however, original cost varied from \$125,000 to \$150,000 or more, depending on the type of engine and other equipment and refinements.

There is not complete agreement, furthermore, on the length of the depreciation period, despite the limit used by the Army when it figured prices at which it took over a large part of the airlines' equipment.

Reconversion Costs—The return towards being sought is to allow also for reconversion costs of fitting the planes for airline traffic and the overhead costs depending on age and condition of the ship.

Thus, the matter is more complicated than a simple application of the CAR purchase formula in reverse. Turned around, that formula might not apply to older planes, whose age and condition might run these costs to a point beyond the residual value. It is conceivable, for example, that the reconstruction and overhaul costs on a green plane which had reached its residual value of \$20,000 might amount to \$30,000, thus creating



NORTHWEST OFFICIALS GREET SOLOMON:

Sare J. Solomon (right), chairman of the Airlines Committee for United States Air Policy, and after his recent return from a Midwest trip that he was ordered at the undisputed interest he found in an intransigent problem, particularly that of competition as chairs intransigent in part-to-use international aviation. He outlined points and policies of the Committee, which favors competition, before the Midway Club at St. Paul. Picture above him being greeted by H. G. Ballou and James C. Glendon, assistants to the president of Northwest Airlines, as he arrived at Wald-Chamberlain Field, Minneapolis.



AIRLINE OFFICIALS AT DENVER-LOS ANGELES HEARING:

Among those present for oral arguments before the Civil Aeronautics Board in the Denver-Los Angeles route case were (left to right) C. E. Fleming, vice-president of Transcontinental & Western Air, W. A. Patterson, president of United Air Lines, William A. Conder, president of Western Air Lines, and Terrell C. Drinkwater, executive vice-president of Continental Air Lines. Drinkwater acted as counsel for his line.

a situation where the Army is expected to be paying a line \$5,990 to take back the plane.

It is far that reason, say those working on the problem, that some other than the CAA's formula in revenue must be worked out for repurchase prices.

Cincinnati-N. Y. Case May Be Enlarged

Other applicants seek to join with TWA and American in consolidated proceeding.

Expansion of the Cincinnati-New York route case appeared likely last week as several other applicants sought at a Civil Aeronautics Board preliminary conference to join with Transcontinental & Western Air and American Airlines in a single consolidated proceeding.

The case grows out of a TWA application of 1939 and an American Airlines decision of 1940, and was postponed once when the Board found action on all route pre-conference early in the year.

Ask Broadening of Scope—Easton, Pennsylvania-Central, United, Braniff, and Chicago and Southern appeared before Boardmen Frank A. Lane, Jr., and Darcen Friedman, asking that the scope of the case be considerably broadened to include these applications in the same general area.

TWA's original application asks Cincinnati as an additional point on AM 3. American is seeking to extend AM 33 from Cincinnati through Philadelphia to New York.

American's counsel said the original application might be withdrawn, substituting later requests covering the same area. Chicago and Southern asked inclusion of a Memphis-Pittsburgh application in the consolidated case.

Pennsylvania-Central sought a hearing in this case of its application for a Detroit-New York route, which would duplicate in part existing operations of other carriers.

Cork Witnesses—The committee asked specifically that city witnesses, exhibits and interventions be held in a session.

Robinson is due Aug. 25 and the case is set for hearing Sept. 12.

Aerovias Braniff Case Expanding

Civil Aeronautics Board's preliminary conference on acquisition of control of Aerovias Braniff S. A., by Braniff Airways last week indicated this matter will develop into a proceeding of far greater scope than an acquisition case, although counsel for Braniff stated he contemplated nothing beyond that.

Eastern Air Lines and Pan American Airways both announced intention to intervene. Eastern's counsel said he viewed the case as "a route case in effect" and urged that it be delayed pending hearing on Latin-American applications. Pan American agreed American Air Lines and United Air Lines also announced their intention to intervene.

Other Problems—The presence

of instructors indicated that problems other than acquisition would be involved.

Counsel for Eastern warned that if Braniff is permitted to form an international system by acquisition of a Mexican subsidiary and thereby circumvent ordinary procedure for obtaining route, emergency procedure might be set.

Examining Gingham and Church did not set any delay in the case, as the extent and nature of exhibits appeared to be indefinite at conference time.

Oral Arguments End In Denver-L. A. Case

CAL official asks Board to disregard WAA acquisition of Inland in reaching decision.

Oral arguments in the Denver-Los Angeles case concluded with a request by Terrell C. Drinkwater, executive vice-president of Continental Air Lines, that the Civil Aeronautics Board disregard Western Air Lines' recent acquisition of Inland Air Lines in deciding who shall be granted the coveted route.

Drinkwater recalled the Board's statement that the Inland of Western and Inland would not make an integrated system. But should the Board put Western into Denver, he said, much better integration would result, as Western then would have two points of contact with Inland instead of the single one of Great Falls, Mont., as it present.

Bonus Favors Western—Public Counsel Mary A. Bowen requested that the Board consider Western for the Denver-Los Angeles connection, differing with the recommendation by Examiner Albert P. Bissell that United Air Lines be granted the route.

Continental feels that a substantial portion of Denver-Los Angeles traffic will be local in nature, which contrasts sharply with the connections of Western, United and Transcontinental & Western Air, the other applicants.

Kansas City-L. A. Route—TWA's application in the case is for a Kansas City-Los Angeles route via Denver, which would extend AM 3 (Denver) for some of the applicants attacked this proposal as an attempt to obtain reconsideration of the Kansas City-Denver case, and pointed out that for the 1941 line in competition with itself for transcontinental business.

More Miles File For Texas-Oklahoma

Applications pour in after report on prehearing conference on local service.

Announcement of last week's prehearing conference on local service in the Oklahoma-Texas area brought many new applications flooding into the Civil Aeronautics Board.

The only operating carrier who filed was Braniff, who asked for Tulsa as an intermediate point on AM 8, and for a series of routes in south Texas. Braniff planes operating non-stop between Kansas City and Dallas via El Paso, Texas, which now receives airline service from American Airlines, Transcontinental Air Lines, and Mid-Continent Air Lines.

Other Routes Asked—Braniff's other applications seek routes connecting Carson, Christi, Laredo and Brownsville, Texas, all presently overlooked points on other Braniff routes. Chiefly local service is sought, and 10-day round-trip would fly the routes if granted.

Four applications from Bonifant named "trade area feeder airlines" also were filed.

Oklahoma Airways, Inc., Oklahoma City, filed for five routes covering the trade area of Oklahoma City. Braniff holds 25 percent of the stock of this corporation.

Dallas-Fredley Lines—Texas Central Airways, Dallas, filed for feeder routes in the Dallas trade area, including north Texas and parts of Oklahoma. Some of the intermediate points requested in this application coincide with points served by Oklahoma Airways, Inc. Here again, 25 percent of the issued stock is held by Braniff.

In the Panhandle region of Texas, another Braniff trade area airline, Great Plains Airways, Inc., applied for routes radiating from Amarillo into parts of New Mexico, Kansas, and Oklahoma, as well as Texas. Braniff holds a 25 percent interest in this corporation.

A fourth trade-area feeder line applicant, 25 percent Braniff-owned, was Lone Star Airways, Inc., San Antonio, Tex., who asked for feeder routes radiating from that city.

Texas-Oklahoma Applications—Other applicants in the Texas-Oklahoma area include:

Southwest Airlines, Russell, N. M., for a proposed route for transportation of mail, passen-

New Air Services

New and additional airline services scheduled with the Civil Aeronautics Board to start this month included:

- **Rainier Air Lines**—new service between Miami and Tampa on AM 48.
- **Mid-Continent Airlines**—additional round trip between Minneapolis and Kansas City.
- **Northwest Airlines**—AM 1 resumes stop at Yakima, Wash.; additional round trips between Chicago and Seattle and Chicago and Minneapolis.
- **Transcontinental & Western Air**—additional round trips between Kansas City and Los Angeles and Dayton and Chicago.
- **United Air Lines**—additional round trip between Chicago and San Francisco.

ports and property over five feeder routes radiating from Houston to include points at Pearland, Humble, Arto, Los Vegas, N. M., and Amarillo, Tex.

Community Air Service, Inc., Fort Worth, for a 429-mile system of feeder routes carrying mail, passengers and express on scheduled service through Texas, Oklahoma and Louisiana. Three other routes out of Ft. Worth, two out of San Antonio, and one out of Houston are requested. Community owns no aircraft.

Wern Central Airlines, Inc., Houston, Texas, asked a permanent or temporary certificate to authorize a scheduled mail, passenger and express feeder service in Texas, Oklahoma, Nebraska, North Dakota and South Dakota.

Other applications include:

Western Airlines, Inc., Western Airlines, Inc., a proposed joint venture of Western Airlines, Inc., and Western Airlines, Inc., is seeking a certificate to operate scheduled mail, passenger and express service between Los Angeles and San Francisco via Los Angeles and San Francisco.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

of Miami of Columbia, Dayton and Toledo, and between Oklahoma City and Tulsa. It would fly (line) bus operators, not the usual scheduled airline service. The proposed service would carry mail, passengers and express on a non-scheduled basis. It would be operated by a group of airlines.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

Florida Federal Airways, Inc., Jacksonville, Fla., is seeking a certificate to operate scheduled mail, passenger and express service between Jacksonville and Miami via Orlando, Fla.

So. Americans Ask Schedule Increases

Expansion of night flight services to cut long haul travel time and increases in daily flight schedules to facilitate greater commercial travel were urged by Latin American airlines at the Conference Inter-American Development Commission in New York.

International airlines should extend their lines to link important industrial, agricultural and mining centers to international markets, delegates said, contending that feeder airlines are considered indispensable auxiliaries to their parent air systems.

Air Service—Almost without exception, delegates predicted that plantations, factories and remote-city routes would spring up in the post-war years. Emphasis in the early stages of these operations, they said, would be on taxi services.

In the field of air freight services, delegates looked for a vast improvement in most of the nations, pointing out that suggestions of freight made highway and railroad construction prohibitive in cost. Only airborne commerce, in many regions, is practical as feasible, they said.

Order Suspended

While the proposal to repeal section 61.343 of the Civil Air Regulations requiring all air carrier aircraft to carry an altitude recording device is under consideration, the Civil Aeronautics Board has suspended the requirement for 30 days.

Flarer Problem—Shortage of trained personnel required to service the instrument has led the Board to suspend the requirement for 30 days. The board is now in consultation of the aviation on behalf of its members.

The rule will probably be amended for the duration, but the Board indicated that a similar regulation would be put into effect in the post-war period.

Why Most Major Airport Fueling Installations are BOWSER!

The reason why most of the major airport fueling installations are Bowser, not only in this country but on the transoceanic routes as well, are the reasons why Bowser will serve you better, too. Here are the high spot facts in Bowser headlines...

Complete Range of Equipment—Bowser above-ground and under-ground systems have up to 4,000 g.p.m. capacity. There are marine, mobile, portable and contained types for virtually every need.

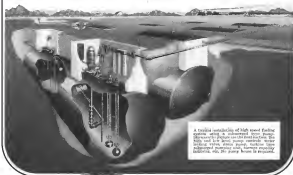
Engineering Service—If special needs are not met precisely by standard Bowser equipment, we will engineer and build the installation you require.

ACCURATE MEASUREMENT—Bowser's famous Xacto Meter measures and records every drop of fuel before it is dispensed. Xacto Meter easily meets all Federal and State tolerances.

Clean, Dry, Safe Fuel—Impurities and moisture are removed while the fuel is being dispensed—concrete assurance of clean, dry, safe fuel. A strainer in the suction line catches heavy particles, and a Bowser Centrifugal Filter removes any remaining impurities and free moisture.

Dependability—Bowser dependability is supported by the company's record in liquid control specialties since 1885 and by its specific experience in fueling airplanes since the birth of the aviation industry.

Service-Plans—For medium and smaller airports, or for backing smaller planes, install Bowser Service-Plans. Compact, sturdy built, easily installed, simple to operate. Service-Plans is a complete airport service station entirely self-contained. AVIATION DEVICES, TORONTO, INC., Port Wayne 2, Indiana.



A typical installation of high speed fueling system with an automatic flow pump. Bowser's Xacto Meter can be used for fuel. Safety and low level pump controls insure perfect filling, eliminate spills. Surface-type submersed metering also, handles varying fuel grades, etc. No pump losses in equipment.

Not only does Bowser's new product line include the most advanced liquid control equipment but Bowser can do the work of other companies.



BOWSER

★ THE NAME THAT MEANS READY CONTROL OF LIQUIDS ★

Clark Subcommittee Studies Labor Stand

Unless told to favor "chaos instrument" for U.S. in foreign air commerce

The position of organized labor with respect to post-war international commercial aviation is being brought to the attention of Congress in written documents and oral testimony before Sen. Clark's Senate Aviation Subcommittee.

The Union, which have made their position clear, may be said in general to favor a chosen instrument for the United States in foreign air commerce, continuation of the national air sovereignty policy and restrictions against the operation of air services by competing transportation modes.

Labor Regulates Vow—Using three key proposals, labor has answered at one time or another the questions raised by the Clark Aviation Subcommittee and is now explaining its views on forced appearances before that group in executive sessions. Labor and other interested organizations may be called later to testify publicly. Only the CIO, apparently, has remained silent.

One of the most forceful declarations is made by George Meany, secretary-treasurer of the American Federation of Labor. Writing in the current American Federationist, main organ of the AFL, and hence presumably with his organization's backing, Meany declares any type of "freedom of the air."

Points to Shipping Decline—It is not easy to explain or confuse Americans advocating a policy which all relevant experiences and evidence indicate is dangerous if not suicidal for us," Meany says.

He draws attention to the decline of American shipping under



RCAF REVISES REPAIR DEPOTS:

Two-story shops like this have been installed by Royal Canadian Air Force in the center of its repair depots to save space and time. Every part of the larger is in view of the repair shop in the administration office on the second floor. Tools and spare parts are on the ground floor. Aircraft operate counter-clockwise about the structure through various overhead, repair and inspection services.

a "freedom of the sea" policy, saying "note the progressive retreat of American shipping to our coastal trade waters—where alone they had protection from 'freedom of the sea'."

Ches Cheap Competition—Meany attributes that decline as a carrying nation to the low wage levels and government subsidies used by our competitors, and says these features will be "even more dominant" in air transport.

With regard to the chosen instrument, he says that "it seems especially prudent in that while a unilateral of American-flag international airlines would give us the maximum competitive strength and the best available protection for American jobs and wage standards, such unilateralism also would give us type and freedom for studying the many complexities of the problem and for formulating our policy after mature deliberation."

Becks REEA Sign—He endorses the stand taken by the Railway Labor Executives' Association in a resolution adopted last month which declared against freedom of the air, demanded that foreign and American international air carriers start at gateway ports as that de-

stitute carriers would be secured of the business from there on, and supported a chosen instrument in which domestic carriers could hold stock.

The Railway Labor Executives, who represent 30 affiliated unions with a total membership of 1,200,000, also demanded that business air bases be made available to American-flag international air services.

Last week the Clark subcommittee heard similar views expressed by the Brotherhood of Locomotive Engineers and the Brotherhood of Railway Trainmen. These groups have forwarded their conclusions to President Roosevelt and the Senate and House Commerce Committees.

Air Sovereignty—"For the present," they said, "we must consider complete sovereignty of the air as a necessary principle of national safety."

The committee also heard Harvey W. Brown of the International Association of Machinists. Brown has made his position clear in a letter to the President. He called freedom of the air in "open invitation" to airlines of "cheap labor" continues to drive the United States off world routes.

WAL Takes Over

Western Air Lines has begun active operation of Inland Air Lines, according to William A. Coulter, Western's president. He also declared that Western plans to ask the CAB to make permanent Inland's temporary certificate between Denver and Cheyenne.

Inland has pending before the Board applications for routes between Denver and Minneapolis and Chicago and Seattle.

Airlines May Design Their Own Planes

United Air Lines engineer W. W. Davies predicts varied aircraft types for future use

From its expansion by the war, the airlines have been given time to think and plan towards the day when new equipment again becomes available for peacetime operation.

These planes into the future have led some to predict that the day may come when the lines will state their own specifications and then call for bids on the exact planes they desire for their individual needs, in contrast with earlier days when they took what the manufacturer had to offer, with perhaps a few minor alterations.

Others feel that such a time is far distant, despite expected expansion in the air transport industry in the immediate and later post-war years. They reason that it will be long before any line is at a point where its equipment needs are so great that it can so large a scale that they can not be satisfied by planes available on the open market. Plane manufacturers also may be expected to develop their wares, they explain, to anticipate the desires of the carriers.

Evidence keeps appearing, however, that these matters are being considered by engineering and research departments. One of the most recent indications comes from United Air Lines' research engineer, W. W. Davies, who spoke recently before a Curtiss-Wright production engineering forum in St. Louis.

Little Time for Analysis—In the past, said Davies, there was little time for engineering analysis. But now air transport is establishing itself as big business, and henceforward it will be required to be economical to take any newly developed airplane and arbitrarily operate it as an airline system giving varied and diversified service.

The job to be done must be defined first, and the specifications for the airplane written about this as a base.

Acknowledging the desirability of combining aircraft of similar characteristics for the sake of simplicity, Davies suggested that a large carrier with five or six different types of market or service might find it possible to handle its

Next 20 Years

If United Air Lines estimates an aircraft, the next 20 years may see nearly a 20 percent growth of domestic air transportation, W. W. Davies, UAL's research engineer, says this means a change of:

- 80 percent of all first class Pullman passengers
- 25 percent of railway coach and inter-city bus travel
- All first class mail over 400 miles
- 40 percent of parcel post
- 40 percent of all express now moved by rail
- 70 percent of less than railroad mail freight
- 8 percent of less than truckload motor freight

operation with only three or four general types of plane.

A Federal Aviation (FAA) report of the Interstate Commerce Commission shows that bus and highway carried about 83.5 percent of inter-city travel, railroads 16 percent, and airlines the remainder. The report on aircraft development, advanced operating methods, and reduced costs, United's man concludes that "the potential is there for a very great expansion of air transport."

Admittedly, the future picture is vague, but studies may be made in the meantime of what the airplane requirements may be. United's work here has dealt with possible aerodynamic improvements and advances in materials and structures in the next five to ten years, advances in equipment such as heating and ventilating, landing gear, hydraulic systems and the like, special instrument including complete instrument landing and black to black control, and trends in aircraft propulsion units.

Plane Types Needed—From these and others, and the conclusions thereon, says Davies, comes the "best idea toward writing the specifications." His own guess, "subject to change without notice," is as planes that may be needed five to six years after the war, including:

- **Commerce Transport Class**—300 seats to 10,000 miles. Passenger—50 to 60 in a single aisle; 100 to 120 in a double aisle; 150 to 180 in a triple aisle.
- **Local**—400 to 600 seats and 10,000 miles. Passenger—50 to 60 in a single aisle; 100 to 120 in a double aisle; 150 to 180 in a triple aisle.
- **Local**—400 to 600 seats and 10,000 miles. Passenger—50 to 60 in a single aisle; 100 to 120 in a double aisle; 150 to 180 in a triple aisle.

• **Local**—400 to 600 seats and 10,000 miles. Passenger—50 to 60 in a single aisle; 100 to 120 in a double aisle; 150 to 180 in a triple aisle.
- **Local**—400 to 600 seats and 10,000 miles. Passenger—50 to 60 in a single aisle; 100 to 120 in a double aisle; 150 to 180 in a triple aisle.
- **Local**—400 to 600 seats and 10,000 miles. Passenger—50 to 60 in a single aisle; 100 to 120 in a double aisle; 150 to 180 in a triple aisle.

No Fundamentals—Streamlining the value of the airlines' operating experience to solutions of design problems, particularly passenger, cargo and crew accommodations. Davies noted that "in data no basic fundamentals have been established for commercial airline airplane design." United, recently began to study these problems in a program that will include use of working mock-ups and final preparation of specifications for manufacturers.

Chicago-N.Y. Run To Use VHF Radio

Operations with new installations expected to begin sometime later this year

First Federal airway to begin functioning with very high frequency radio range installations between New York and Chicago, scheduled to begin actual operations this year, according to Clara M. Lample, assistant director of Federal Airways.

The Civil Aeronautics Administration plans to cover the airway from medium to very high frequencies was drawn up before the war, but military requirements made procurement of the necessary equipment impossible.

Nearly Ready—The two range stations on the New York-Chicago Airway are nearly complete and operations will begin as soon as active planes can be found with receivers.

It is understood that manufacturers are now able to supply receiver installations to the airlines. Lample said VHF operations on this airway would familiarize airlines pilots with the use of the electronic equipment in preparation for the changeover of the entire system of Federal airways.

The new type equipment gives the pilot both visual and aural indication of his relation to the proper course.

Relationship of very high frequency

to other frequency designations follow:

- **Very Low Frequency (VLF)**—below 30 kilocycles
- **Low Frequency (LF)**—30-300 kilocycles
- **Medium Frequency (MF)**—300-3,000 kilocycles
- **High Frequency (HF)**—3,000-30,000 kilocycles
- **Very High Frequency (VHF)**—30,000-300,000 kilocycles
- **Ultra High Frequency (UHF)**—300,000-3,000,000 kilocycles
- **Super High Frequency (SHF)**—3,000,000-30,000,000 kilocycles

Foreign Reinsurance "Dangers" Doubt

U. S. aviation underwriters disagree with Board's view that aerial security is imperative

Aviation insurance underwriters, in their expressed reply to the Civil Aeronautics Board's report on the handling of these risks, fail to see the danger the Board said in foreign participation in reinsurance and in addition prophesy that the American insurance market will be a big factor in the international reinsurance field after the war.

In denying reliance on foreign sources for reinsurance, the Board pointed to possible dangers to national security and disclosure of secret operating practices and procedures developed by American carriers.

No Secret Data Revealed—To this, United States Aviation Underwriters, Inc., replies that "it is no case in secret information regarding American planes or airlines disclosed." This group's statement, says its letter to the Board, merely renews information about the risks they reinsure.

Even if such secrets did exist, the letter states, they would not be unique to insurance.

Perfect Record

American Export Airlines claims a perfect flight safety record for 1943 on all scheduled and non-scheduled trans-Atlantic operations, including flights under contract with the Naval Air Transport Service as well as scheduled operations on regular routes.

Report places high method and workload trans-Atlantic speed records for commercial aircraft.



PCA STUDIES "PRE-ROTATION" TIRE

The new "pre-rotation" tire, on which flexible tubes are airplane wheels spinning before they reach the runway, is being inspected after 400 hours on a Pratt & Whitney-Central DC-3. Fred Marshall, left, represents R. F. Goodrich Co., which developed the new tire to save rubber and ease landings. With him is George W. Anderson, PCA co-pilot.

security cannot hope to operate airlines in foreign countries or to sell them airplanes without disclosing far more information in respect to the airlines or the airplanes than is ever in the possession of the insurers.

Harvested Again—The group stressed reciprocal aspects of reinsurance, concluding that if this country attempts to exclude foreign reinsurers, "we may be excluded from insuring even American enterprises in foreign countries." Such a course, it is felt, would lead to more active competition from abroad for direct insurance of aviation risks, with disclosure of more material of less information to foreign insurers.

Pointing to efforts they have already made in the international field, the underwriters express the belief that an American aviation insurance market also international in its scope can best serve American air carriers engaged in extensive international flying, and the hope that that market will be a large factor in the international reinsurance field, both directly and through exchange of reinsurance.

State Supervision—The 13 points in the letter deal, in addition to foreign participation, with state ownership, profits, and competition. The underwriters assert that in view of inaccuracies in the report, expensive figures were not entirely reliable. To the Board's

suggestion that underwriting groups have headed to fix rates at too high a level, the reply was made that figures indicate "no regular tendency" to do so.

The letter cites facts calculated "to correct any impression created by the report that there has been or is an absence of active competition in aviation insurance, or that the three major groups are free to divide the business among themselves on their own terms."

Cites Perils of State Air Laws

It will be surprising if commercial aviation can survive without causing state legislation of the type that has hampered the transportation industry. Rep. Jennings Randolph (D. W. Va.) told the Rotary Club of New York.

Randolph said state laws can have extremely serious consequences if they are not prepared after due consideration for the national need for uniformity and maintenance of a uniform national policy for aviation.

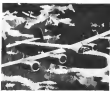
Points to European Situation—He also indicated that European flying had been choked by non-sensical laws of various nations and that the result for America's leadership in the air has been partly the development of aviation under single, nationwide regulations.

This advertisement is one of a series which is appearing in national magazines and newspapers as Consolidated Vultee's contribution toward a clearer public understanding of transportation's role in the war, and its postwar opportunities and responsibilities.

The Story of "The Hump"—the world's most dangerous overland air route



1. Today, American airmen are facing a greater task—carrying military supplies to hard-pressed China than was ever needed over the famous Burma Road. They're flying to over "The Hump"—the towering Himalayas between India and China. It's the most treacherous air route in the world. But the freight goes through!



3. Day and night, the heavily loaded Liberator Express transports planes across the world. The heavy "Shuttle Express" is a trusted crew of experienced navigators, they enjoy even the most difficult task. They're an ever-present link in the air. Flying overhead, the cargo planes are often attacked by Japanese fighters. Still the freight goes through!



2. The freight of the journey is over the towering, jagged Himalayas. Because there are no emergency landings, pilots must fly the planes with great care. And the men who fly are usually glad they're in safety, aided by more pilots who drop within minutes, look out, and collect supplies by parachute.



4. The clouds are the sky. The "Hump" is the only channel by which India and China are connected. Around the globe, at various times, the men who fly carry a constant stream of gasoline, food, drugs, ammunition, supplies, mail, news, clothing, medical supplies and spare parts.



5. Many of our Indian-Chinese flights have been awarded decorations—and they're proud of them. The men are proud that the supplies being flown are so important to the war effort in China. But the same courage and courage that can conquer the lofty Himalayas will eventually reach out new thousands of miles to the land's edge of supplies will lead to an air victory.



6. After the war, when all lanes of transportation that were open for rebuilding the postwar world, the plane will continue to play its part, along with the truck, the train and the ship. But the plane will have a second, and even greater, responsibility to fulfill that of helping to advance the peace in the 40-year-old world.

In short, a permanent peace in the Pacific can be the first step in a permanent peace in the interests of a better world.

Quick Facts for Air-Minded Readers

Freedom of the Skies—Last year, 10% of the dollar value of all imports to the U. S. came by air—a 50% increase over 1939.

Many of the air cargoes included silk, sugar, crystals, industrial chemicals, and rare drugs, without which the production of steel and many materials would not have continued.

Saving American Lives—Liberty has 100,000 men who are the first line of defense against the Japanese. The Army has already flown out several hundred thousand soldiers from combat areas to England.

It takes 100 men—The Air Service Command reports that the Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific. The Army has 100,000 men in the Pacific.

CONSOLIDATED VULTEE

AIRCRAFT

See Also: C-47
B-24 Liberator
B-25 Mitchell
B-26 Marauder
B-29 Superfortress
P-51 Mustang
P-40 Warhawk
P-47 Thunderbolt
P-48 Lightning
P-50 Chevalier
P-52 Mustang
P-53 Mustang
P-54 Mustang
P-55 Mustang
P-56 Mustang
P-57 Mustang
P-58 Mustang
P-59 Mustang
P-60 Mustang
P-61 Mustang
P-62 Mustang
P-63 Mustang
P-64 Mustang
P-65 Mustang
P-66 Mustang
P-67 Mustang
P-68 Mustang
P-69 Mustang
P-70 Mustang
P-71 Mustang
P-72 Mustang
P-73 Mustang
P-74 Mustang
P-75 Mustang
P-76 Mustang
P-77 Mustang
P-78 Mustang
P-79 Mustang
P-80 Mustang
P-81 Mustang
P-82 Mustang
P-83 Mustang
P-84 Mustang
P-85 Mustang
P-86 Mustang
P-87 Mustang
P-88 Mustang
P-89 Mustang
P-90 Mustang
P-91 Mustang
P-92 Mustang
P-93 Mustang
P-94 Mustang
P-95 Mustang
P-96 Mustang
P-97 Mustang
P-98 Mustang
P-99 Mustang
P-100 Mustang

See Also: C-47
B-24 Liberator
B-25 Mitchell
B-26 Marauder
B-29 Superfortress
P-51 Mustang
P-40 Warhawk
P-47 Thunderbolt
P-48 Lightning
P-50 Chevalier
P-52 Mustang
P-53 Mustang
P-54 Mustang
P-55 Mustang
P-56 Mustang
P-57 Mustang
P-58 Mustang
P-59 Mustang
P-60 Mustang
P-61 Mustang
P-62 Mustang
P-63 Mustang
P-64 Mustang
P-65 Mustang
P-66 Mustang
P-67 Mustang
P-68 Mustang
P-69 Mustang
P-70 Mustang
P-71 Mustang
P-72 Mustang
P-73 Mustang
P-74 Mustang
P-75 Mustang
P-76 Mustang
P-77 Mustang
P-78 Mustang
P-79 Mustang
P-80 Mustang
P-81 Mustang
P-82 Mustang
P-83 Mustang
P-84 Mustang
P-85 Mustang
P-86 Mustang
P-87 Mustang
P-88 Mustang
P-89 Mustang
P-90 Mustang
P-91 Mustang
P-92 Mustang
P-93 Mustang
P-94 Mustang
P-95 Mustang
P-96 Mustang
P-97 Mustang
P-98 Mustang
P-99 Mustang
P-100 Mustang

See Also: C-47
B-24 Liberator
B-25 Mitchell
B-26 Marauder
B-29 Superfortress
P-51 Mustang
P-40 Warhawk
P-47 Thunderbolt
P-48 Lightning
P-50 Chevalier
P-52 Mustang
P-53 Mustang
P-54 Mustang
P-55 Mustang
P-56 Mustang
P-57 Mustang
P-58 Mustang
P-59 Mustang
P-60 Mustang
P-61 Mustang
P-62 Mustang
P-63 Mustang
P-64 Mustang
P-65 Mustang
P-66 Mustang
P-67 Mustang
P-68 Mustang
P-69 Mustang
P-70 Mustang
P-71 Mustang
P-72 Mustang
P-73 Mustang
P-74 Mustang
P-75 Mustang
P-76 Mustang
P-77 Mustang
P-78 Mustang
P-79 Mustang
P-80 Mustang
P-81 Mustang
P-82 Mustang
P-83 Mustang
P-84 Mustang
P-85 Mustang
P-86 Mustang
P-87 Mustang
P-88 Mustang
P-89 Mustang
P-90 Mustang
P-91 Mustang
P-92 Mustang
P-93 Mustang
P-94 Mustang
P-95 Mustang
P-96 Mustang
P-97 Mustang
P-98 Mustang
P-99 Mustang
P-100 Mustang

See Also: C-47
B-24 Liberator
B-25 Mitchell
B-26 Marauder
B-29 Superfortress
P-51 Mustang
P-40 Warhawk
P-47 Thunderbolt
P-48 Lightning
P-50 Chevalier
P-52 Mustang
P-53 Mustang
P-54 Mustang
P-55 Mustang
P-56 Mustang
P-57 Mustang
P-58 Mustang
P-59 Mustang
P-60 Mustang
P-61 Mustang
P-62 Mustang
P-63 Mustang
P-64 Mustang
P-65 Mustang
P-66 Mustang
P-67 Mustang
P-68 Mustang
P-69 Mustang
P-70 Mustang
P-71 Mustang
P-72 Mustang
P-73 Mustang
P-74 Mustang
P-75 Mustang
P-76 Mustang
P-77 Mustang
P-78 Mustang
P-79 Mustang
P-80 Mustang
P-81 Mustang
P-82 Mustang
P-83 Mustang
P-84 Mustang
P-85 Mustang
P-86 Mustang
P-87 Mustang
P-88 Mustang
P-89 Mustang
P-90 Mustang
P-91 Mustang
P-92 Mustang
P-93 Mustang
P-94 Mustang
P-95 Mustang
P-96 Mustang
P-97 Mustang
P-98 Mustang
P-99 Mustang
P-100 Mustang

Airline Officials' Stock Purchases In Own Firms Are 7 1/2 Times Sales

Report to Securities and Exchange Commission shows, 17,708 shares were bought and 2,343 sold during April

Airline officials purchased 7 1/2 times as many shares of their companies' securities during April as they sold, Data made public by the Securities and Exchange Commission show purchases of 17,708 shares of airline stocks by officers, directors and principal stockholders against sales of 2,343 shares.

Purchases of common stock of Colonial Airlines, Inc., by officers and directors of the company accounted for a large portion of April acquisitions, with officials buying 12,001 shares.

W. C. Colwell, president of Colonial, purchased 5,000 common during the month, bringing his holdings to 21,616 shares. Alexander C. Dick, secretary, bought 5,581 shares, to give him 1,661 common. Edward S. Sully, vice-president, increased his holdings to 3,990 shares through the purchase of 3,000 shares, while Francis Hattley, Jr., a director, bought 193 shares, making his holding 1,630 shares at the end of the month.

Crail Hunter, president and general manager of Northwest Airlines, Inc. reported acquisition of 1,899 common through an exercise of rights under an option agreement. At the close of the month he had 4,556 common. Hunter also gave away rights to 500 common.

Northwest—Robert M. Hardy, a director of Northwest, bought 500 common, increasing his holdings to 1,569 shares at the end of April. E. Irving Wyatt, vice-president and treasurer, bought 515 shares to give him an ownership of 1,454.

William K. Kennedy, Jr., vice-president, increased his holdings to 75 shares through the purchase of 25 shares. William Stern, a director, bought 83 shares and received as a gift 53 shares, increasing his holdings to 443 shares at the close of the month.

Samuel J. Solomon, director of Northwest Airlines, Inc., sold 1,700

common, reducing his ownership to 15,339 shares. John S. Woodbridge, controller, sold American Airlines, sold 193 shares, reducing his holdings to 990. John C. Franklin, vice-president of Transcontinental & Western Air, Inc., sold 128 common, leaving him 150.

Eastern—Paul H. Brittain, vice-president of Eastern Air Lines, Inc., filed a report showing purchase of 2,000 common last December, giving him 5,000 shares at the close of last month.

T. E. Bennett, president and principal stockholder of Braniff Airways, Inc. reported the gift of 300 shares during April. His holdings at the close of that month totaled 341,324 shares. George A. Butler and Fred Jones, new directors of Braniff Airways, reported an ownership of 4,500 shares and 666 shares, respectively, on April 3.

Chicago and Southern—L. H. Bilet, director of Chicago and Southern Air Lines, Inc., reported purchase of 376 vics, the disposition of the acquisition of 186 through an exchange, and transfer of 50 shares of C & S common through a joint account. Bilet also reported sale

of 300 voting trust certificates for common stock, as well as the purchase of 376 vics, the disposition of 100 vics through an exchange and 25 vics through a transfer. According to Bilet's report, the joint account was short 2,261 vics at the close of the month.

Among the aircraft manufacturing group, John J. Daly, director, Republic Aviation Corp., purchased 2,998 common, increasing his ownership to 51,314 shares. Mervyn J. Peale, vice-president, bought 166 shares, to give him 288 shares at the end of the month. William K. Eick, vice-president of Glenn L. Martin Co., gave away 150 common, reducing his holdings to 626 shares.

Braniff Salaries, Earnings Reported

Braniff Airways, Inc., paid its president, T. E. Bennett, \$32,250 for 1943, according to the company's annual report to the Securities and Exchange Commission. C. S. Sheridan, vice-president, and C. G. Adams, managing director, received \$32,025 and \$29,351, respectively.

In addition to the \$25,325 paid Bennett in salary, certain insurance and office space required by the company was purchased at the master rates by insurance agencies and from an office building in which he has a direct interest. Net commissions on the company's insurance received by the agencies were \$17,470 and the rental paid to the Bilet Building was \$1,490.

Directors—The aggregate remuneration of five directors of the company was \$97,648 and was paid for their services as officers and employees. No directors' fees were paid.

During the year, the company sold 400,000 shares of its common stock, \$2.10 per value, through P. Sheridan & Co., Inc. of New York, net proceeds being \$845,136.

Pilot's Salaries—Three pilots were paid as follows during 1943: V. J. Powers \$10,070, M. W. Sellmeyer, \$10,572, and Gordon Durrell, \$10,583.

Total operating revenues of the company during 1943, as compared to \$4,945,574, with total operating expenses of \$5,331,313, leaving a net operating income of \$1,113,432. Income from other sources amounted to \$52,266.13, bringing gross to \$1,165,698.13.

Declarations amounted to \$454,645, the largest since which was

\$451,866 for federal-income taxes and declared value excess-profit taxes, and that some other manufacturers have agreed for space, although he would not reveal the names.

Annual Rate Case—The report stated that if the company loses its fight against the proposed reduction in annual rates, the operating revenue from mail for next year would be reduced approximately \$29,187.5.

"If such infund is made and interest rates for the applicable year are thereby reduced in an amount equal to the provision for income taxes thereon for 1943, the net income of the company would be reduced approximately \$39,975," the report stated.

Aviation Salesroom Planned in Chicago

Curtin-Wright sale of surplus goods expected to result in permanent display of planes and parts in Furniture Mart.

Curtin-Wright last week began sale of surplus materials through a central display in the Furniture Mart in Chicago and efforts are being made by officials of the Mart to effect other surplus material transfers into the picture in the administration of an Aviation Mart.

An ultimate permanent display for the aircraft field at the Mart is contemplated. Col. Lawrence W. Waring, president of the Furniture Mart, reveals. He says he hopes to have eleven other plane manufacturers join in the present surplus display.

It is reported that Curtin-Wright found an exhibit at Dayton last month "valuable enough to warrant the establishment of the central display in Chicago."

Scope Extended—However, it is believed that placing of the Aircraft War Production Council was choosing plan to operation will restrict the scope of the Aviation Mart, at least for the materials that will be handled under the warehousing plan. Steel, copper, aluminum and hardware, fittings and component parts, comprise about 33 percent of the surplus goods available.

Materials such as instruments of various kinds, paints and woods could still be moved through individual efforts. It is expected that all of the warehouse materials will have to go to the warehouses to prevent confusion in handling and redistribution.

Whiting and in Chicago had 12,900 square feet of space had

been set aside in the Furniture Mart for the Aviation Mart and that some other manufacturers have agreed for space, although he would not reveal the names. Curtin is occupying 1,000 feet, and may eventually extend their surplus display to include that of subcontractors. For the moment, however, they are handling only their own materials.

Furniture and Plumes—Whiting pointed out that furniture and aircraft manufacturers had discovered many mutual interests through war production, and said he hoped to extend the relationship after the war through operation of the Aviation Mart in post-war years in a place where aircraft manufacturers and suppliers could display aircraft parts in a central market for the convenience of buyers. Facilities there will not accommodate complete planes.

Materials now being displayed by Curtin are virtually all in the warehousing program including radios, nuts, bolts, tools, millar outfits, drills, A-36 standard parts, carbide tools, machine tools, lawn, wire, and steel, aluminum, brass, bronze and copper in sheets, bars, coils and tubing. Average price is said to be average cost to Curtin and sales in the first few days are reported at \$60,000.

Stock Offered

An issue of 113,333 shares of National Airlines common stock, per value \$1, priced at \$1.75 per share, was offered last week. The stock is to be sold with the quarter additional working capital for investigating service over A.M. 21 between Jacksonville and New York, and will also finance National's expansion plans.

C-54 Output Up

Douglas Aircraft has announced a 400-percent increase in the production of C-54 transports at Santa Monica, which will eliminate formal buy-offs of any workers due to increase of the A-26 contract.

When the A-26 contract conclusion was first forecast, it was feared that about 2,000 workers would be affected. The increase in the C-54 production contract at Santa Monica, plus work on the A-26, will combine to keep most of the workers on the job.

Subcontracts Sought For Brewster Plant

Efforts still were being made last week to obtain subcontracts for the Long Island City plant of the Brewster Aeronautical Corp. No decision had been reached last week on a proposal that the Brewster organization subcontract to supply Carrier parts to Goodrich.

Meanwhile, efforts were being made to obtain a special War Relocation Commission ruling to make it possible for Brewster to reassemble its working force if contracts are obtained in the near future. Regulations stipulate that workers can return from other jobs in 30 days and an extension of that to 60 days for Brewster workers was requested both by the commission and the UAW-CIO union.

Payoffs—The company, whose Carrier contract was canceled in May and will run out July 1, had laid off 5,694 workers last week and most of the balance of the 8,500 employees expected in determination notice within the next few weeks. Almost all of the discharged workers were interviewed last week and more than 2,000 referred to new jobs. Certificates of availability were issued others to enable them to seek employment on their own. Operations at Johnstown will continue to July 1, when the Navy will take over the facilities.

Financial Reports

Bendix Aviation Corp. reports net income of \$4.02 per share for the six months ended Mar. 31, as compared with \$3.87 for comparable period a year ago. Net income is reported at \$2,061,998 for the six months compared with \$1,948,018. Unfilled orders Mar. 31 had dropped from \$1,874,468,000 last year to \$781,200,000. Changes in the procurement needs of the armed services produced a net price amount for the decrease. F. H. Beech, Bendix president, said.

Timken to S. A.

Timken Roller Bearing Co., Canton, Ohio, anticipating a greatly accelerated growth in South America after the war, has organized a subsidiary, the Timken Roller Bearing Co. of South America, with headquarters in São Paulo, Brazil. Julius A. Moreland, former New York representative for Timken, is managing director.

Invasion

THE CRUCIAL PHASE of my power's task has begun. The initial landing operations were backed by 11,000 planes flying two, three or even four sorties a day. The fleet is still growing. It must be backed up by thousands of unarmored mechanics, technicians, clerks, desk workers in the Army and Navy. This is no time for aircraft workers to think of tomorrow's penurious job. This is what we've been working for.

Costly Economy

THE BUREAU OF THE HONOR recently reduced the figure for the next fiscal year which had been requested by the Civil Aeronautics Administration for aircraft technical development. At the time the matter received no public attention. The full meaning of the incident now is apparent with notification by CAA to chief engineers of the airlines that its aircraft development section must drop several vital projects as which valuable work already has been done. Actually, a priority list must be prepared at once to determine which few will be continued.

Budget Bureau says that only emergency war work should be given funds to continue development. In cutting CAA's aircraft development program, it thus fails to take into consideration the fact that even warplanes will benefit from much CAA work. It ignores the tremendously important role of transport aircraft in this or any future war. It fails to realize why our highest military officers determined that the Army's Air Transport Command alone should now have nearly a thousand multi-engine transports in its world-wide war operations, and why both Army and Navy air transport services will be slapped up in the coming year.

For the record, the list of projects which had been undertaken by the Aircraft Development Section before Budget Bureau's cut includes vital work on:

1. Crash-resistant fuel tanks
2. Collision-resistant windshields
3. Accelerometer for measuring landing data
4. Power-plant installation fire tests
5. Aircraft fabric testing device
6. Shell warning indicators
7. Automatic instrument log
8. Aircraft control characteristics recorder
9. Aircraft lighting
10. Instrumentation for the study of vibration and flutter
11. Photographic equipment for measuring aircraft performance

Such a list may appear meaningless to a Budget Bureau expert, but every project above has a direct bearing on the future safety of passenger and military aircraft, as well as on the weather outfit, as we know it. In the long run, the military services would gain as much in CAA's work as any other civilian group.

The excellent wartime research and development facilities of Army and Navy are swamped at the moment with work on projects directly concerned with combat aircraft. Military transport aviation is benefiting very little directly from these facilities. It has far more to gain during wartime, from CAA.

Budget Bureau's attempts at economy are shortsighted and may be responsible for needless loss of life. They should be challenged by responsible members of Congress when the time comes for hearings on the next supplemental appropriation.

Straight Thinking

THE PUNISH Bureau issued by the House Committee on Civil Service, the recent inquiry into the training program of the AAF's Women's Air Service Pilots, is an excellent summary. All the strange confusion, inconsistencies and errors in judgment are marshaled in logical array, told without error or provocation. It is a good example of the investigating staff has presented a simple, straightforward story which is devastating.

The committee finds the WASP program was unnecessary in the first place because there were always men pilots available. It was started at a time when the AAF was eliminating 15 of its primary training contract schools and conceding aviation courses at 151 colleges. Entrance standards and age limits were dropped for women trainees, yet men with long experience were ignored. Training costs were excessive. Training standards were lower than at regular Army schools, and the courses prescribed were inferior.

There have been at least 18 deaths, and introduction of additional unskilled personnel will probably accelerate the accident and fatality record. A large percentage of the WASPs will never qualify to pilot transport aircraft. The Committee believes a program involving 2,500 graduate trainees and some \$50,000,000 in public funds should have been of sufficient importance to have had the specific authority of Congress—which it never had, even after numerous requests.

The Committee found that any elimination of WASPs or trainees represents a total loss to the taxpayer, whereas AAF advice not qualified as pilots are given an opportunity to qualify in other capacities. The Committee was told repeatedly that, if the fast fighter and heavy bomber had increased, it will be necessary to depend upon already qualified multi-pilot personnel anyhow. Very little confidence was expressed by Army officials in the ability of hastily trained girls to withstand the strain of heavier duties. The average civilian instructor can be fully qualified to operate the Class A and B planes months ahead of the WASP recruits now available.

"It is not understood why the qualification for both men and women should not be identical, and why the proven experience of the available male personnel is not being utilized," the Committee says. "It is impossible to escape the conclusion that this discriminatory attempt to demonstrate that the millions of dollars of public funds spent with the approval and at the instance of the War Department, to train these civilian instructors has been useless and unavailing. The Committee must reject such reasoning."

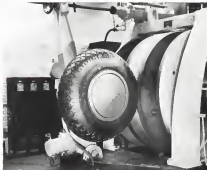
Those familiar with the WASP picture realize there was no other logical conclusion possible. The Committee has done a service to the country and to aviation.

ROBERT H. WOOD

...and in **SYNTHETICS** it's **GENERAL** for TOP-QUALITY!

WHAT HAPPENS AFTER REPEATED LANDINGS?

...to the heads, the tread, the cords? General 56" synthetic-nylon, static conductor, smooth canvas tire, here is shown mounted on a huge dynamometer. Any potential weaknesses arising from milling and braking loads are discovered as the mounted tire is "landed"—again and again—"on the fly-wheel" whose surface speed approximates aircraft landing speeds. Today's synthetic-nylon General passed the test for *extreme landing speeds* with flying colors... just as it passed many similar rigid laboratory tests covering every phase of service conditions.



General Synthetic-Nylon Aircraft Tires Meet and Better General's Rigid Performance Standards!



Tested in conjunction with the Army Air Forces, General's special compound of synthetic rubber has proved its excellent wearing qualities, in rigid service tests as well as rigid laboratory tests.

Thus, in synthetic-nylon aircraft tires—as with former construction, General Tire has demonstrated its ability to engineer and produce a tire that delivers the *extra* quality for which Generals have always been known.

Regardless of new materials or service requirements, you can depend on this. General Tire will continue to set the standard for Top-Quality in airplane tire design.

★ ★ ★

General's synthetic construction is available with nylon or rayon for tail-wheel tires as well as main landing gear tires.

Authoritative Division: THE GENERAL TIRE & RUBBER COMPANY, Akron, Ohio.



A MILLION HOURS

Training Pilots

ONE OF America's first pilot training organizations to fly a million hours, Southwest Airways has trained pilots from some 29 different countries at its 4 great flying fields in Arizona.

With as many as 500 planes in operation by students in various stages of training, dependable engine performance has been of major importance.

Southwest Airways has assured itself of unfailing engine performance with an outstanding maintenance organization and dependable petroleum products. The Texas Company is justly proud of the part it has played in sup-

plying the major portion of Aircraft Engine Oil and Aviation Gasoline for this outstanding operation.

Because of the benefits that Texaco delivers—

More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

Texaco Aviation Engineers will gladly cooperate in securing increased engine life with Texaco Aviation Products, available at leading airports in the 48 states. The Texas Company, *Aviation Division*, 135 East 42nd Street, New York 17, N. Y.



TEXACO Lubricants and Fuels

FOR THE AVIATION INDUSTRY